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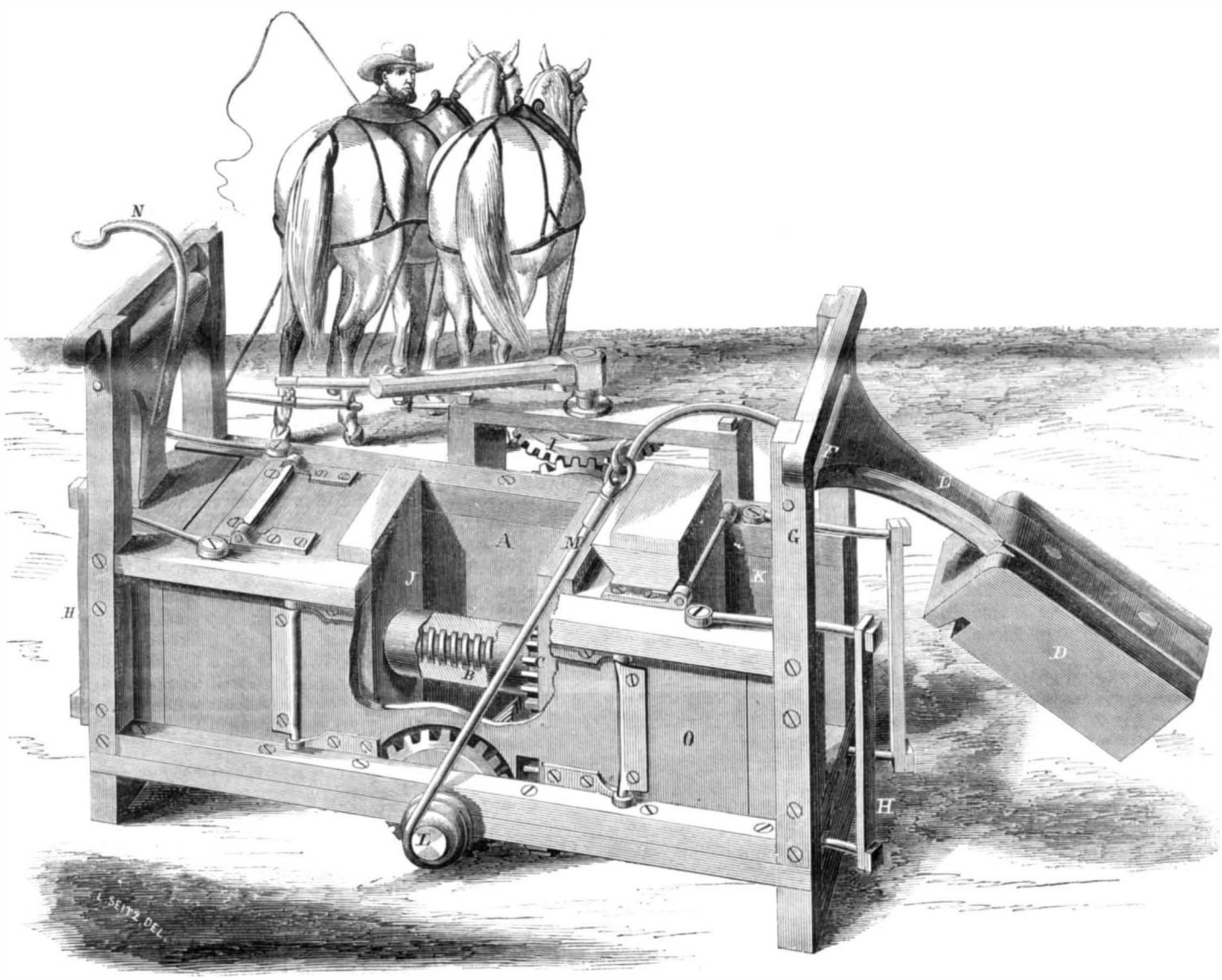
Improved Beater Hay Press.

Great improvements have latterly been made in hay presses, or that class of machines which reduce the bulk of fibrous substances. Formerly, simple pressure was employed, but in later machines the force of percussion or beating is added, and the result is that the mass is condensed almost to solidity. The advantages thus gained are great, for by the increased density of the bales they are preserved much longer in a fresh condition, and besides this the greater facility with which hay, wool or cotton can be transported is an important feature. Beater hay presses, as they are called, are generally very high and topheavy so that the several parts are out of reach. In this press all parts are easy of access; the machine stands horizontally and the action of the beaters is in the same direction. In the engraving, A is the box or case, in which the hay is pressed, with a part between broken out to show the screw, B, which exerts the pressure. This screw is driven by the gear, C, and the thread runs the same way through its length. One of the press-boxes is shown open on the right, with the beater, D, elevated, in the act of striking. This beater is a heavy cast-iron weight or block, firmly secured to the arm, E, which works on a hinge, F, in the upright frame, G. The other end of the box is closed, and the clamps, H, are slipped over its sides. When the horses travel round, the bevel gears, I, rotate the screw, which causes the follower. J, to move toward the end. Meanwhile the hay, which has been placed in the compartment, K, is receiving a series of blows from the beater. This detail is driven by the worm, L, which is so made that the greatest force, in lifting the beater weight, is exerted when the lift comes hardest, as in its present position. When the belt, M. arrives at the end, as shown, it slips off, and the beater falls heavily against the hay in the box, thus rapidly reducing its bulk. The weight strikes every time the horse travels round, or with every additional forkful of hay. It will be seen that the pressing is always continued or going on in one compartment or the other, for when the beating is completed on one side the belt is transferred to the opposite arm, N, and the bale just beaten, pressed by the action of the screw, as above explained. The finished bale is taken out at the door, O. This press is portable and can be worked in a stack yard or any place where a horse can travel; it can also be taken apart and put in a common wagon. A patent is now pending, through the Scientific American Patent Agency, by D. L. Miller, of Madison, N. J., whom address for further particulars.



MILLER'S BEATER HAY PRESS.

Steel in English Iron-clads.

The *Army and Navy Gazette*, London, says:—"We are informed that in the construction of Mr. Reed's new ship, the *Lord Warden*, there will be employed at least 500 tuns of toughened steel, manufactured under the process known as Bessemer's. The advantages derived from the employment of this improved material are so obvious, that it is daily attracting increased attention from the authorities at Whitehall. We are told that this cast steel is much tougher and stronger than wrought iron, and less liable to fracture. It is more uniform in texture. In consequence of its extreme toughness a shaft may be reduced in weight, and yet lose nothing of its required strength. This is a feature which shipbuilders and engineers can thoroughly appreciate. Again, there is less friction with steel than with iron. Thus steel shafts work with greater ease than those of iron, and lastly, experience has proved that the durability of steel shafts is three times as great as that of iron."

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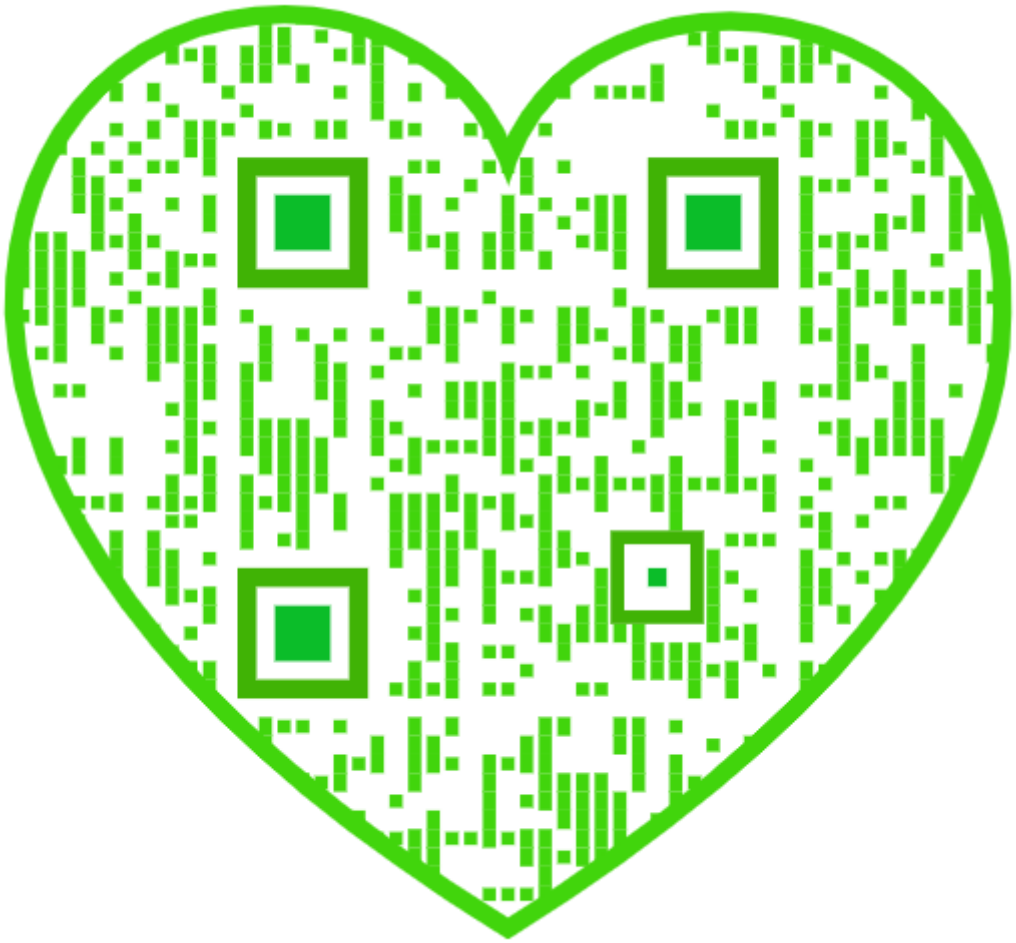

Classical vs. Scientific Education.

Among the gentlemen summoned before the Parliamentary commission for investigating the condition, etc., of certain schools and colleges in England, was Mr. Farraday, who, on the question as to the comparative value of the classical and scientific sys tems of education, said:—

"Up to this very day there come to me persons of good education, men and women quite fit for all that you can expect from education; they come to me and they talk to me about things that belong to natural science; about mesmerism, table-turning, flying through the air, about the laws of gravity; they come to me to ask questions, and they insist against me, who think I know a little of these laws, that I am wrong and they are right, in a manner which shows how little the ordinary course of education has taught such minds. Let them study natural things, and they will get an idea very different from that which they have obtained by such education. I do not wonder at those who have not been educated at all, but such as I refer to say to me, 'I have felt it and done it and seen it, and though I have not flown through the air, I believe it.' Persons who have been fully educated according to the present system, come with the same propositions as the untaught, and stronger ones, because they have a stronger conviction that they are right. They are ignorant of their ignorance at the end of all that education. It happens even with men who are excellent mathematicians. . . . Who are the men whose powers are really developed? Who are they who have made the electric telegraph, the steam engine and the railroad? Are they the men who have been taught Latin and Greek? Were the Stephenses such? These men possessed that knowledge which habitually had been neglected and pushed down below. It has only been those who, having a special inclination for this kind of knowledge, have forced themselves out of that ignorance by an education, and into a life of their own."

Sorghum for Dyeing.

The Sorgho *Journal* recently contained an interesting communication from Prof. Erni, chemist of that department of agriculture, concerning experiments in coloring with sorghum cane, that have been conducted under his supervision. His attention had been called to the subject by reading some accounts of experiments in this direction. He says the simplest solvent is alcohol, but that is now too expensive, and attention was turned to other materials, thus far with entire success, and at a trouble and expense hardly worth mentioning. All the colors and shades mentioned (crimson, purple and brown), were produced from the same bath, the cloth being afterward drawn through solutions of chloride of tin, bichromate of potassa, sulphate of copper, etc. The Professor continues:—

"Having found upon an upper shelf in the laboratory some canes of last year's growth, sent here for the purpose of analysis, and which had become almost entirely destroyed by insects, I selected a few stalks—the outside of which were more particularly exposed to the atmospheric air, and had become deeply red. With two ounces of the cut cane a great number of samples of cloth were colored, a portion of which are those accompanying this report. The same coloring material found in the stalk is evidently contained in the seed.

"It may be proper for me to add, that it is not important that the canes should be fully matured.

"As far as tested, I find the colors to resist the action of sunlight and water in a most satisfactory manner."

A Photographic Baby.

The following appears in the *British Journal of Photography* of Oct. 28:—"Some time since my wife was engaged preparing albumen paper in the silver-bath, and in a moment of abstraction pressed two of her fingers on her forehead, being at the time about to add another 'olive branch' to the family. Soon after the birth of the baby we were surprised and annoyed at noticing that the child, when in a strong light, exhibited two distinct impressions similar to silver stains before fixing; and the strangest part of the matter is that these disappear as night comes on and reappear as daylight arrives. I have not yet attempted to 'tone and fix' these said stains; and, although at present serving as a sort of actinometer to me, will prove a sad disfigurement to my daughter's appearance in daylight, and we much regret they were not impressed in some less conspicuous place. I am, etc., the father of the Photographic Baby."

The editor adds:—"Were the writer of the foregoing not known to us we should have thrown aside his letter as an impudent hoax; but as we know him well as an excellent photographer, a good citizen, and as being little addicted to joking, we give his communication a place in our journal and leave those more competent than ourselves to explain the strange phenomenon, which we believe to be faithfully recorded by our correspondent."

A Great Engineering Feat.

In Brazil, M. Brinless, assisted by English capitalists, has been engaged in "lifting" a railroad—the San Paulo—over the great Sierra de Mar, a mountainous elevation two thousand feet high. The entire ascent is divided into four "lifts," or inclines of a mile and a quarter each, running at a gradient of one in ten. A level platform or "bank-head" marks the summit of each incline, and at the upper end of the platform is a stationary engine. This engine has double cylinders of twenty-six inches diameter, with a five-foot stroke, and has been calculated to haul up fifty tuns at the rate of ten miles per hour. Five boilers of the Cornish description are placed with each engine. On the upper half of each incline there is a double line of rails, with arrangements for passing places in the middle of each of these "lifts." A single line of rails then runs on from the center to the foot of each of the four divisions into which the ascent is divided. A steel wire rope, one and a half inches in diameter, is made for pulling up the ascending trains. This rope, tested by a weight far exceeding the requirements that will be made upon it, passes over friction wheels, and is attached to the fly shaft. The inclines are therefore partially self-acting, at the same time passing one train down to the foot of the Sierra, and drawing up another to the high levels on its way out to the province beyond. This feat is pronounced a bold and impracticable one, but with science and skill scarcely any physical obstruction can stand permanently in the way of human wants or necessities.

One ravine crossed is 900 feet in span on the level of the railway, and is crossed by a viaduct resting on clusters of iron columns, which spring up from enormous stone piers 200 feet below the center of the line which passes over them. The work is nearly completed, and will then open a way for travel and traffic between the seaboard and the interior. The Emperor of Brazil is making all kinds of useful improvements in his territory, and thereby assisting its industrial and commercial development.

Nashua Iron Works.

The Nashua Iron Company are very busy working up ten tuns of iron daily, to the monthly value of $70,000. Among the specimens of work just receiving the finishing touch are a ponderous crank-shaft, weighing seven tuns, for the steam-sloop *Pensacola*, and another shaft for the frigate *Franklin*, at Portsmouth, weighing eleven tuns. These are grand pieces of workmanship. Besides having a great amount of other work in process of manufacture, the company is turning out a large number of locomotive tires and cranks, axles and shafting for the machine shops at Lowell, Manchester and elsewhere. The number of hands employed in the works is about two hundred, and the monthly pay-roll amounts to $8,000. The workmen are paid all the way from eight shillings to eight dollars per day. About twenty-five tuns of coal are consumed each day. The capital of the company is $125,000.

Lea's Cleaning Solution.

The photographic fraternity is under great obligations to Mr. Carey Lea, of Philadelphia, for the knowledge of the following glass-cleaning preparation:—Water, 1 pint; sulphuric acid, ½ ounce; bi-chromate potash, ½ ounce. The glass plates, varnished or otherwise, are left, say 10 or 12 hours, or as much longer as desired, in this solution, and then rinsed in clean water, and wiped or rubbed dry with soft white paper. We have used the solution in our laboratory long enough to be satisfied of its superior excellence for the purpose specified. It quickly removes silver stains from the skin without any of the attendant dangers of the cyanide of potassium. We think that photographers who once give Mr. Lea's preparation a trial will be glad to discard all others.

MISCELLANEOUS SUMMARY.

A Preparation for Preserving Leather.—We translate from the *Gerber Courier* a receipt for a preparation which is said to insure great durability to leather and to make it very pliable and soft. It consists of four articles, tallow, soap, rosin and water. These ingredients are prepared as follows:—Twenty-one parts of tallow are melted in a vessel, three parts of rosin added, and the two when melted mixed well together. In another vessel seven parts of good washing soap are dissolved in seventy parts of pure rain water. After it is dissolved and the mass heated to the boiling point, we add the part prepared before, let it boil once more gently, and the preparation is ready for use. It is especially adapted to boots, harness leather and belting.—*Shoe and Leather Reporter.*

Sheep Skins for Mats.—Steep the skins in water, and wash them well till they are soft and clean; they are then scraped and thinned on the flesh side with the fleshing knife, and laid in fermented bran for a few days, after which they are taken out and washed; a solution of salt and alum is then made, and the flesh side repeatedly and well rubbed with it, until it appears well bleached; after which make a paste to the consistency of honey, of the alum and salt solution, by adding wheaten flour and the yolks of eggs, and spread this paste on the flesh side; after this they are stretched and dried, and when dry, rubbed with pummice stone.

A Miner on a Strike Starved to Death.—The Birmingham correspondent of the London *Engineer* says:—"An inquest was held last week on the body of a miner who had been on a strike, and who had for some time preceding his death been on a short supply of food, and had to sleep in the open air for eight consecutive nights. A verdict of 'died from cold, exposure, and want of sufficient sustenance,' was returned."

Gas Leaks.—Much gas and labor that are now wasted, might be saved, and the price of it possibly cheapened to the consumer, were there some satisfactory means of finding the precise locality of a leak in the pipes when it occurs outside of a building, and underground. The person who shall invent an efficient gas-leak-detector, will make a fortune and benefit the public.

While filling the reservoir of the Charlestown, Mass., water works, a few days since, the pumps would not operate, and an examination proved that the pipe was completely filled with eels. The next day the trouble occurred again, and on the two occasions over 2,500 pounds of eels were removed.

[Turbine wheels in some of our large cotton factories have been stopped from this cause.—Eds.

To Keep Eggs.—Last August, we placed a thick layer of salt on the bottom of a large sap-bucket; oiled the eggs with fried meat fat, and placed them in the salt in such a way as to prevent touching each other, little end down; then a layer of salt, then eggs, till the bucket was full. Set in the cellar. Used the last in May, and found them as fresh as need be—not a bad one among them.—*Ohio Farmer.*

The Hadley Company, at Holyoke, are manufacturing a very superior, soft finish, six-corded spool cotton, pronounced by competent judges, who have used it, to compare favorably with the most popular brands imported. James M. Beebe & Co., Winthrop square, Boston, are the agents.

The number of persons or firms engaged in the manufacture or sale of books in the United States is now about 4,000, of whom about four-fifths are in the Northern or loyal States. Of these 2,000 are booksellers exclusively, and about 200 are publishers of books.

Over seven thousand acres of land have been leased in Perry county, Ind., by a wealthy Louisville company for the purpose of operating in the oil business.

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COTTON THREAD.—In our article upon the manufacture of cotton thread in this country, published on page 345 of our current volume, we stated that the price of Coats's English thread, so well known here, "speedily ran up to four times its old rates in consequence of the high price of foreign exchange." The Coats cable thread, of a beautiful quality, is now manufactured from long staple Egyptian cotton, a fine sample of which is now before us. The quotation price is given at $1·50 per dozen—which is not much higher than the best American qualities. This subject is one of general interest to our people, and we may hereafter refer to it.

CALIFORNIA WINE CULTURE.—The vintage of California is estimated this year at over six millions of gallons—so much for the present. The crop of wine per acre is from 650 to 1,000 gallons—according to quality and growth. The number of acres fitted for the growth of wine was estimated by Hon. Wilson Flint, President of the California Wine Growers' Association, and stated to the Commissioner of Internal Revenue, to be twenty millions of acres. Others there have named five millions. Taking the least estimate and the minimum yield, we have the capacity of the possible future yearly wine crop of California at 3,250,000,000 gallons.

NEW MECHANICAL ACTION OF STEAM.—An English inventor says:—"It is claimed that the expansive force of the steam acts equally on the two pistons, and forces them apart with the power due to the area of the pistons and the pressure of the steam, and that the force thus exerted on both the pistons is united and conveyed to the crank shaft; whereas, in steam engines of the usual construction, with a piston working in a cylinder, *half the force exerted is always acting on one of the ends of the cylinder.*"

DUBLIN INTERNATIONAL EXHIBITION OF ARTS AND MANUFACTURES, 1865.—We have received from Mr. P. L. Simmonds, a notice of this exhibition. It will be opened in May, 1865, and will remain open till the end of October. Exhibitors may obtain full information by addressing Mr. P. L. Simmonds, House of the Society of Arts, John street, Adelphi, W. C., London, England.

THE American Academy of Arts and Sciences has recently elected the following foreign honorary members:—M. Charles, the mathematician, of Paris, in place of the late Baron Plana; Prof. Bunsen, of Heidelberg, in place of the late Heinrich Rose; and Otto Strure, of the Imperial Observatory, at Pulkora, in place of the late M. Ostrogradsky.

THE Detroit (Mich.) *Advertiser* says the low stage of water in the Western lakes is something remarkable. A fall of about two feet has recently taken place, and the water is now four feet lower than in 1861. At some of the ports on Lake Huron it is now difficult to make landings where formerly there was water to spare.

EXHIBITION OF INDUSTRY AT STETTIN.—We have received from Charles J. Sundell, Esq., U. S. Consul at Stettin, Prussia, a notice of an industrial exhibition free to all nations, which is to be held at that place next spring. Articles will be received during the month of April; they will be duty free, but a small charge will be made for the space which they occupy in the building.

EAST SAGINAW, Mich., contains 45 steam sawmills and 47 salt works, with 20 smaller sawmills on the tributaries of the Saginaw. These forty-five mills have fourteen gangs and fifty-two mulay saws, and cut during the year 1864 about 125,000,000 feet of lumber.

IRON ore has been found at Cape Race, Newfonndland, and large quantities are said to be situated along the coast. This will of course account for the remarkable variations which occur in the compass off the coast.

MR. HAMMOND, of South Carolina, is dead. He it was who first applied the term "mudsill" to stigmatize Northern mechanics.

MANY of our business firms are now using the postal money order as a medium for paying bills in different parts of the city.

M. DU CHAILLE, of gorilla notoriety, is continuing his explorations in Africa, and has shipped a living specimen of those animals to England.

COAL DUST.—There is a company organized in this city to manufacture fuel out of the dust of coal. They have discovered a process by which the dust is formed aud kept in a solid compact mass, and their experiments prove it to be a very valuable fuel. It burns freely and thoroughly, and gives out as much heat as solid anthracite. The coal dust, we understand, can be purchased at the mines, where there are immense quantities of it hitherto unused, for the small price of forty cents per tun, or one dollar per tun if sifted, and it is estimated by the very intelligent persons engaged in the enterprise, that a tun of solidified coal dust can be sold at from four to five dollars a tun.—*Philadelphia Bulletin.*

THE ladies of Paris, not content with dyeing their hair red, now dye their lapdogs to match the color of their dresses. Green dogs, yellow dogs and sky-blue pugs are all the rage. Wealthy parties have sets of lapdogs of all colors A purple lapdog would be an addition to a fine landscape!

A CONFECTIONER in this city got up a Thanksgiving cake for the Ladies' Home Mission, which was ten feet long, 22 inches wide and 16 inches thick. To make it, it took 1,000 eggs, 175 lbs. of flour, 125 lbs. of sugar and 80 lbs. of butter.

Desultory Reading.

The author of "Waverley" remarks somewhere in that work, that a feeble and indecisive habit of mind is produced by desultory and omnivorous reading. An English critic denies this, and insists that the author himself a direct contradiction to his own assertion. The writer also refers to Pliny, who, according to his nephew, made a sensible observation on reading—that there is no book so bad or so foolish as not to supply something worth recollecting. But then how few books were within the reach of Pliny, the uncle! Pope read everything, and so did Warburton, from the fathers of the church to the last pamphlet by old Dennis. Milton, we are told, spent his youth in poring over romances, and his poetry, remote as his subjects are from those which fill the pages of such compositions, is thoroughly instinct with their spirit; even in hell an astute critic remarks, he finds a corner to bring in Charlemagne and all his peerage fighting in Fontarabia, against the forces sent from Biserta upon Afric's shore. In the temptation of our Saviour we are presented with Agrican and Gallephrone, and Angelica the fair. Nay, when disclaiming the themes of his early favorites as frivolous, he does it in their own language, and tells of impresses quaint, bases and trappings, gorgeous knights at tilt and tournament, etc. Hobbes used to say that he never read books "lest they should make me as foolish as those who do;" and yet the man who translated Thucydides in youth, and Homer after he was eighty, the sturdy champion in a thousand controversies, must have been a most various reader.

After all, as a witty writer has well remarked, little people like to lurk behind great names—to defend their own propensities, by proving them in some degree analogous to the powerful minds of the world. Whatever may have been the habits of some great men, the remark in "Waverley" is founded in good sense. The idea is finely illustrated by the late Prof. Bush, in an early oration, wherein he enforces with great clearness and ability the evils of an unsettled mode of study, and even insists that the moral tendency of desultory reading is pernicious. This may be found in the inadequate and unsatisfactory memoirs of that eminent scholar, published soon after his death in 1859.

Unlimited Glass.

Fitz-Hugh Ludlow, in his overland trip to California, found between Utah and the Humboldt Mountains a large desert composed, as he says, of "sand of snowy alkali." He describes it as one of the most dismal and forbidding spots that was ever traversed by the foot of man; but in view of the extension through it of the Atlantic and Pacific railroad he suggests an interesting possibility as to its future use. He says (*Atlantic Monthly*, p. 616):—"In its crudest state the alkaline earth of the Desert is sufficiently pure to make violent effervesence with acids. No elaborate process is required to turn it into commercial soda and potash. Coal has been already found in Utah. Silex exists abundantly in all the Desert uplifts. Why should not the greatest glass-works in the world be reared along the Desert section of the Pacific Road? and why should not the entire market of the Pacific Coast be supplied with refined alkalies from the same tract?"

This opens up a pleasant prospect. Glass, unlimited glass! A desert of soda and sand, with coal underneath! Glass-works of some thousands of miles in extent, the materials ready mixed, and the furnace, as it were, ready to be lighted up!

NEW BOOKS AND PUBLICATIONS.

ATLANTIC MONTHLY.—The *Atlantic* for December is one of the most interesting numbers of this valuable periodical that has been issued during the year. A perusal of its pages is refreshing after the dull and tedious commonplaces of other magazines, or the pert flippancy of smart writers in the ephemeral literature of the hour. Such writers as Mrs. Stowe, Caroline Chesebro, Edmund Kirke and O. W. Holmes, such poets as Longfellow and Whittier, write frequently in the *Atlantic*, and each number has, in addition, articles from other celebrities in the literary world.

The House and Home Papers of Mrs. Stowe abound in hints and suggestions on domestic reform, not the least important one of the series alluded to is that upon domestic cookery. No habit of daily life is more important than feeding the body, but with us the old adage falls true, "Heaven sends meats but the devil sends cooks." Mrs. Stowe appreciates the French system of serving food in an appetizing manner, and cooked with a "toothsome" flavor. Our own want of economy as well as slovenliness in this respect are properly enough deprecated.

The *Atlantic Monthly* for 1865 promises to be more attractive than in years gone by, for with a more extended circle of readers a change in its general conduct seems shadowed forth. By this we mean an effort on the part of the editors to render it more attractive to the general reader; as an instance, the House and Home Papers are prominent. We hope the magazine will have a long addition to its subscription list.

THE ERICSSON TURRET IRON-CLADS.—Mr. Isaac Newton, First Assistant Engineer in the United States Navy, has recently written a pamphlet on the turret iron-clads, and has forwarded us a copy. We have been interested in its perusal; for the statistics of what foreign powers have done and are doing in this way are compared with our own progress, the results being clearly and concisely stated. We commend the pamphlet to our readers as affording instruction on one of the most interesting topics of the day. Mr. Newton's address is 14 and 15 Studio Building, Boston.

POWDER.

Most persons, probably, suppose that in consequence of the prevailing war the manufacture and consumption of powder in this country must have been greatly increased. But we are assured on good authority that the reverse is the case. The consumption of powder in time of peace is far greater than during war. Gunpowder being an article contraband of war its exportation is prohibited; consequently the immense foreign trade which manufacturers have been for years accustomed to supply, is wholly at an end.

It is a curious circumstance connected with the powder business, that while our Government is in great need of the article, at the lowest prices, it employs the most direct agencies to raise the prices and impede its own supplies. Thus the Government places very large duties, payable in gold, on the raw materials, and then lays heavy revenue taxes on the manufactured article. As the Government is a principal consumer it thus puts itself to the delay and expense of fixing and collecting taxes from itself. One of the results of this foolish plan is to elevate the prices of the raw materials to such a degree that the manufacturers are required to take unusual risks, and employ about three times as much capital, in the supply of their orders, than was formerly needed, and without substantial increase of profits. Under these circumstances, if the wants of the Government cannot be readily supplied, it has no one to blame but itself.

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INTRODUCTION OF THE PORCELAIN MANUFACTURE.

Messrs. Thomas C. Smith & Co., have at Green Point, Long Island, a manufactory of fine porcelain ware in successful operation, and by the courteous invitation of Mr. Smith we have had an opportunity of going over the works in his company, and listening to his explanations of the several processes in the manufacture.

THE MATERIALS.

Clay is the silicate of alumina, alumina being the oxide of the light metal, aluminum. The fine kind of clay used in the manufacture of porcelain is supposed to be derived from decomposition of granite rock. Granite is composed of mica, quartz and feldspar, and each of these minerals is a compound substance. Feldspar is composed of potash, alumina and silica, and under certain conditions it is decomposed, the potash being removed, and the silica and alumina remaining in combination as the silicate of alumina, or clay. This fine clay is found in beds in the earth in numerous places. It is called by the Chinese, *kaolin*, and the name has been introduced into Europe along with the manufacture of China ware. Porcelain is made of kaolin, feldspar and quartz. Clay shrinks very much in baking, and this shrinking causes numerous cracks in the ware, it is therefore necessary to add some substance which will not shrink, and silica is found to be the most suitable. The English find pure silica in the form of flint, and the Americans in that of quartz. Besides the kaolin and the quartz a proportion of feldspar is also employed.

THE SORTING.

Feldspar nearly always contains a black mineral called schorl, and if a particle of this gets ground in with the material it is sure to show as a speck in the ware. The stone, therefore, after being broken, is carefully handled over, and every piece containing any schorl or other foreign substance is rejected.

THE GRINDING AND MIXING.

After the feldspar and quartz are broken and examined they are ground to a fine powder in mills of burr stone, precisely similar to those used in grinding wheat. This powder is then mixed with water and the kaolin, forming a fluid porridge, which is subjected to repeated sittings to remove any coarse pieces that may have escaped being crushed in the mills. It is then poured into broad vats, where it is dried to a paste of the proper consistence for the hands of the molders.

THE THROWING.

Of all implements now used in the arts probably one of the very oldest is the potter's wheel. It is a wooden disk revolving in a horizontal plane upon the upper end of a vertical shaft. For common pottery the wheel is usually turned by an assistant by means of a crank and belt, but in porcelain manufactures the molder turns his wheel by pushing with his foot against the upper side of a parallel wheel fastened below to the same shaft. The workman gathers up with his hand a sufficient quantity of dough to form the vessel which he intends to make, and dashes it down upon the wheel. He then with his foot sets the wheel in motion, and works the dough for a while to get out all the air bubbles. To this end he wets his hands in a pail of water, and draws the pile of dough up into an irregular pyramid, and then flattens it down into the form of an inverted saucer. When sufficiently kneaded he cuts off a piece of the proper size for his purpose with a small wire which is fastened at each end to a short stick for a handle. The piece is placed upon the center of the wheel, and, a rotary motion being continued, is quickly fashioned into the desired form, by pressing the clay with a moist sponge, or simply with the fingers. In some cases a narrow board, the edge of which has been cut into the proper curves and notches, is brought against the revolving clay to impart the proper form to the outside of the vessel.

MOLDING.

Pitchers and many other articles are formed in molds made of plaster of Paris. The workmen first throws a lump of dough upon his wheel and fashions it into an irregular hollow cylinder, somewhat like a hat crown, which he sets down into the mold. The mold is then set upon the center of the wheel and rotated, while the workman, partly with his wet fingers and partly with a moistened sponge upon the end of a stick, presses the clay outward, close against the walls of the mold, and forms the inside of the vessel. The mold is made in two halves, so that it can be readily taken apart and the vessel removed.

Mr. Smith finds it very important to change his hands as little as possible from one kind of work to another. One of his men has been constantly employed for two years and and seven months in making one kind of small cream pitcher for restaurants.

BAKING.

After the clay is fashioned into ware, it is set aside to dry for two or three weeks, when it is ready for baking. It is baked twice, the glazing being applied between the first and second baking. After the first baking the ware is called biscuit, a manifest misapplication of the word, which is from the French *bis*, twice, and *cuit*, baked, meaning twice baked instead of once. One of Mr. Smith's kilns is 60 feet high, and 14 feet internal diameter, with walls 3 feet 4 inches in thickness. It is divided by two arched diaphragms or floors into three compartments, the lower one for the second baking, the next for the first baking, with an extension above contracted as a chimney to increase the draft. The heat is supplied by eight anthracite furnaces disposed radially around the base of the kiln.

When the ware is ready to be baked it is placed in pots or boxes of coarse earthen ware, called saggers, to protect it from the smoke, and to enable the pieces to be piled one upon another without being bent out of shape. The bottom of one sagger forms the cover to the one beneath, and the joint is luted with a cord of soft clay to make the joint air-tight. These saggers somewhat resemble in form small shallow cheese boxes. The workmen set each sagger full of pieces of ware, the spaces between the larger pieces being occupied by smaller ones so as to economise the space. When the kiln is filled, the entrance is closed and luted, and fires are started in the furnaces. The interior is brought to an intense white heat which is contined from 40 to 45 hours. The fires are then extinguished, and the kiln is allowed to cool slowly for two or three days, when it is opened and the ware is removed.

GLAZING.

The glazing on porcelain is lime glass. Glass is silica combined with potash, soda, lime, or other metallic oxide, and the kind of glass which has the right degree of fusibility to serve as a glazing for porcelain is lime glass. Quartz, feldspar, and lime are mixed together in the proper proportions with water, and the biscuit—the ware after it has been once baked—is dipped into the mixture. The biscuit comes from the kiln so perfectly dry, and the clay in this state is so greedy of moisture, that the articles as they are raised from the bath have the glazing upon them dried instantly by the absorption of the water into the body of the ware. When the articles are placed in the lower apartment of the kiln, and are again subjected to a high temperature, the lime and silex of the glazing are melted and enter into combination, forming a silicate of lime, which is lime glass.

ASSORTING.

The baking of the porcelain is a very delicate operation, and a variable proportion of the articles is sure to be injured in the process. In some, the clay settles down so as to change the form, in others, the glazing is cracked, or some other damage occurs. Consequently the ware must be assorted carefully after coming from the kiln. The second quality is sold at half price. Mr. Smith says that he has discovered that some of the dealers have been selling his second quality ware for American, and his first quality for imported.

THE WORKMEN.

The workmen are mostly French and German. They are very skillful, but it is amusing to see how fond they are of carrying the material long distances on their heads or shoulders. Mr. Smith is remodeling his works, and arranging them in such manner as to save all unnecessary handling and carrying of material. He is also introducing power for turning the wheels, and for doing everything that can be done by machinery.

THE PRODUCT.

Some very handsome porcelain is now being turned out from the works at College Point. The first attention has been given to make the manufacture pay, and ware for hotels and restaurants mostly has been made up to the present time. Door and drawer knobs are made in large quantity, but the process for those is so peculiar that we purpose to describe it at another time.

Chinese Adulterations of Tea.

The following article on the above subject, from the pen of one of the most experienced tea buyers in this city, will be read with interest. The two general classes of tea known as "green" and "black," are both subjects for chicanery. The Chinese to meet the demands for tea, are often "obliged" to "make up" the styles to "suit the eye," of the "foreign barbarian;" and if at the same time they can deceive the palate, this is lucre gained. To accomplish this, they use leaves, flowers, roots, barks, buds, seeds and stems of shrubs, plants, and trees, foreign to the real tea. The class "green" is more generally known to be colored. To meet this predilection among the Americans for the "verdant," the Celestials use Prussian blue—ferrocyanide of iron—a deadly poison; gypsum—sulphate of lime—or plaster of Paris, such as our farmers use as a manure, turmeric—the root of the *Curcumalonga*, used as a medicine and a dye, to make this beautiful "green." Sometimes the drug indigo is used in the place of the Prussian blue.

To color the "blacks," a preparation of iron—a most deadly poison—is often used, as well as the juice of certain barks. The leaves of the *Epilobium augustiflorium* (excuse the length of this name, as it is botanical), the Gardenia florida, as well as its flowers, are used to mix with teas. The leaves of the *Camelia susanqua* and other varieties of the *Camelia;* also those of the *Rose*, their buds and stems, and the leaves of the *Olea fragrans* as well as their flowers, with a host of others, are mixed in with true tea, for the purpose of adulteration. Indeed, there are so many leaves growing in China that resemble the tea leaf in shape and color, that they avail themselves of this species of fraud for the purpose of increasing their wealth. The writer has often taken these foreign leaves from packages of tea; some of which possess no more the flavor of qualities of tea, than the autumn leaves of our own forests. Lie tea is the dregs of all that pertains to real tea. It is made from the sweepings of the China tea packing houses, consisting of the broken leaves of all the various teas, both "green" and "black," damaged and spurious, dust and dire, cemented together with rice water, or the "serum of the blood of animals," and rolled into grains. If for "black" tea, it is colored with a preparation of iron; if for "green," it is colored with turmeric, Prussian blue, and plaster of Paris, and in appearance is a good imitation of delicious gunpowder tea. The proportion of mineral matter in the genuine tea leaf, is from 5 to 6 per cent; in the lie tea, from 37 to 45 per cent; chiefly sand and vile impurities.

This lie tea is imported to this country—particularly the lying gunpowder. The writer has a sample out of two thousand boxes which were sold in a New York tea sale, at four cents per pound; and a tea judge would, from appearance, decide it to be worth fifty cents or more per pound. This stuff, put with true "green" tea, will make a mixture deleterious in its effects upon the constitution of the drinker, and makes up a real lying compound. Another variety from the same source, called "little tea," "tea endings," "tea bones,"—anomalistic in name, as well as quality—is imported to this country for the purpose of adulterating wholesome and good teas. This is the sweepings of the "Hongs," consisting of the dust of "green" and "black" teas, passed through sieves to make it uniform in size. There are millions of pounds of damaged teas, musty, decayed, and those that were once infused, brought to America, and find their way into the stomachs of even the fastidious. The wild tea plant affords vast quantities of leaves, which are made into a kind of miserable tea, used for adulteration. It is sold for from five to fifteen cents per pound, and even more.

An oil well has been sunk to the depth of 2,000 feet at Jackson, Mich., and it is proposed to continue to the depth of 3,000 feet if necessary to strike oil—a depth of 400 feet greater than any well yet sunk on this continent.

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Correspondence

OUR SPECIAL CORRESPONDENCE.

The Most Surprising Result of the War—The Unparalleled Prosperity of the Manufacturing Interest—The Cotton, Woolen, Silk, Hair and Iron Manufactures—The Great Fortune Made by the Screw Company—The Healthy and Stable Condition of our Manufactures.

PROVIDENCE, Nov. 27, 1864.

MESSRS. EDITORS:—Among all of the surprising results of the war, certainly the most surprising is the extraordinary prosperity of our manufacturing interests, and this is most manifest in this center of the manufacturing district. It is true that only about one-third of the cotton machinery is running, but the cotton manufacturers, by the great rise in the staple, have made more money during the last four years than they have in any previous four years since Samuel Slater landed in the country and introduced the business of spinning by machinery. In all other departments of manufacturing, profits are unprecedented. Edward Harris, of Woonsocket, the largest woolen manufacturer in the country, is building quite a village to accommodate the workmen for his new mill. In this city the Fletchers, who, very quietly, in a little wooden factory, accumulated a great fortune in manufacturing coach trimmings, shoe strings, and other braid, have finished an enormous mill for the extension of their works. The Perkins Street Iron Company have purchased an extensive tract of land running from Harrison to Dexter streets on the north-east side of Long Pond, where they are about to erect a very large rolling mill for the manufacture of boiler and sheet-iron of various descriptions; also of galvanized gas pipe and gasometer iron of all the different gages. The land includes three and a quarter acres, which will be occupied by the buildings, coal yards, stables, etc., necessary in so large an enterprise. The main building will measure 200×100 feet, beside two wings, 60×60 each. The blacksmith's and carpenter's shops will measure 40×100 feet. The buildings will be of wood, and one story in hight, as all the machinery, on account of its great weight, must be placed on the ground. There will be eight chimneys, each 65 feet in hight and 6 feet square. There will be three engines of some 600-horse power. The rolling mill will be of the most massive description, such as is used in rolling the Monitor iron. About three hundred hands will be employed, and some operatives from England are already engaged. There are only two or three as large establishments of the kind in the country, including those of Baltimore and Philadelphia. A very large per cent. of the sheet iron now in use in this country is imported.

A large silk factory at Olneyville is nearly finished, and there is an extensive manufactory of hair cloth at Pawtucket. Capt. Walter O. Bartlett has recently erected machinery in this city for the manufacture of lead pipe on a scale to supply the demand throughout this region, and is turning out a very perfect article. There are two establishments for the manufacture of horse shoes by machinery, and I just saw a wagon go by heavily loaded with boxes of the finished article.

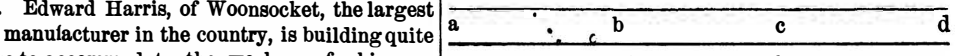
But by far the most profitable of all the manufactures of the city is the making of screws. Here is one man who is taxed for $700,000. Some years since one of his creditors failed, and settled with him by giving him a few shares of stock in the Screw Company. There is another, an old schoolmate of mine, whose rich and miserly old uncle made a sharp bargain, as he supposed, in selling his nephew some stock in the Screw Company, and now the young man is far richer than his uncle. It has not been unusual for this company to divide 10 per cent. per month for many months in succession. They have purchased several patents, paying for one of them $60,000. A rival establishment, as you are doubtless aware, is now in course of erection at Jersey City, opposite New York.

In Providence, as in other places, the manufactories are being erected by capital in the hands of the owners, and there will, consequently, be no danger of those general bankruptcies which occasioned such wide-spread distress in the early days of manufacturing, when mills were built with money hired from banks on four-months notes. The sales of the manufactured articles are generally for cash or on thirty days, instead of the eight-months credit system which formerly prevailed. Our manufacturing, as well as our commercial industry, rests upon more stable foundations than it ever did before. B.

Duck Guns.

MESSRS. EDITORS:—Duck guns of 50 to 100 pounds weight have not attained in this country to that degree of perfection which those of English manufacturers have, and as the subject will be interesting to many of your readers, and is one which, if understood and practiced, would save quite a sum annually to the country, which is now sent to England, I will endeavor to explain the manufacture of the barrel, omitting the forging.

Swivel duck guns are generally made from 60 to 100 pounds weight, 7 to 9 feet long, and from 1¼ to 1½ inches bore, according to the size and weight. I will now give the dimensions of three different guns, which were celebrated for long range and close shooting. The following diagram will be necessary to understand them:—



a is the muzzle of gun, *d* is the breech, the space from *b* to *c* is called the cylinder, and is of uniform bore. The relief is commenced at *b* and the bore is gradually enlarged to *a*; the breech is opened behind by enlarging the bore from the rear end of cylinder, at *c*, gradually to the breech, at *d*. Now let us turn to the formulas:—

DIMENSIONS OF A 62-LB. GUN MADE BY FULLARD, A CELEBRATED LONDON MAKER.

Cylinder	2 feet 8 inches long.
Relief	4 feet 1 inch long.
Opened behind	6½ inches long.
Total length barrel	7 feet 3½ inches.

Bore of cylinder, 1½ inch diameter; relieved to the $\frac{1}{20}$th of an inch; opened behind $\frac{1}{24}$th of an inch.

A GUN OF 90 LBS., MADE BY FULLARD.

Cylinder	2 feet 9 inches long.
Relief	4 feet 2 inches long.
Opened behind	1 foot 3 inches long.
Total length	8 feet 2 inches.

Bore of cylinder, $1\frac{5}{32}$ inches; relieved to the $\frac{1}{16}$th of an inch; opened behind, $\frac{1}{20}$th of an inch.

A GUN OF 70 LBS., MADE AT BIRMINGHAM.

Cylinder	2 feet 7 inches long.
Relief	4 feet 4 inches long.
Opened behind	10 inches long.
Total length	7 feet 9 inches.

Bore of cylinder, 1¼ inch; relieved to the $\frac{1}{16}$th of an inch; opened behind to the $\frac{1}{32}$ of an inch.

The critic may ask—Why is relief given at the muzzle? I answer, for the purpose of making it throw shot close together at long distances. Why opened behind? Because if relief were given at the muzzle, and the rest of the bore left a perfect cylinder, the gun would shoot weak. By enlarging the bore behind we retard the powder sufficiently to insure its full ignition, thereby gaining strength in shooting. In turning off the outside of the barrel the workman should make a perfect taper from breech to muzzle, so that the line of sight will be perfectly true. He should also be careful to leave plenty of metal at the breech, and remember that the heavier the gun is in proportion to the bore the better it is to preserve aim in firing. Short guns require to be made much heavier than long ones to ease the recoil proportionately. J. T. S.

Kingston, N. Y., Nov. 22, 1864.

Rule for Cutting Screw Threads.

MESSRS. EDITORS:—I take the liberty to inclose to you a rule for cutting screws in engine lathes, which is as follows:—

Multiply the number of desired threads to the inch, and also the number of threads to the inch in the lead screw, by any number the product of which will correspond with the gearing you have. If you wish to cut fractions of threads, use the denominator for a multiplier, and add the numerator. Example—Suppose we wish to cut 12 threads to the inch, and the lead screw is 4 threads to the inch, we multiply them both by 5, which is 5×12=60; 4×5=20; 60 and 20. A gear of 20 teeth on the spindle, and one of 60 on the screw will cut 12 threads to the inch. Suppose, however, that we want to cut a fraction of a thread; we will take 9⅗th threads to the inch, and the lead screw is 5. Multiply them both by the denominator, which is 5. No. of threads in lead screw —5×5=25; 9⅗×5=48; 25 on the spindle, and 48 wheel on the screw will cut 9⅗ threads to the inch. If the lathe gearing is compound different calculations will have to be made, but most lathes have or use straight gearing, which this simple rule is best calculated for. It may be necessary sometimes to use a fraction for a multiplier; it depends, however, upon what gearing is in the shop.

CHAS. E. ALBRO.

No. 12 Abingdon Square, N. Y.

[In cutting screws every careful mechanic will take an old mandrel and trace the thread upon it, so as to verify the calculation by actual count before executing the work in hand.—EDS.

Official Report on Davis's Composition.

NAVY DEPARTMENT, Nov. 25, 1864.

MESSRS. EDITORS:—I have sent herewith a copy of a report of Commander J. W. A. Nicholson, dated the 2d inst., in relation to the use of Davis's composition on the hull, side armor and propeller of the *Manhattan*.

G. A. FOX,
Assistant Secretary of the Navy.

U. S. SHIP "MANHATTAN," MOBILE BAY, ALA., November 8, 1864.

Rear Admiral D. G. FARRAGUT, U. S. N., Commanding West Gulf Blockading Squadron.

SIR:—The outside of the vessel's hull, side armor, and the propeller, were covered in New York with three coats of Davis's composition, and presuming the Department would like to know the result of its action, and whether it is really an article of merit or not, I make the following report:—

No grass or barnacles had formed upon our propeller or side armor up to the 20th of July last, owing to having been most of the time at sea, steaming; but since then it has formed with astonishing rapidity on the side armor, requiring to be scraped off constantly.

The propeller has been covered until a few days since; I then had it thoroughly scraped; there was a solid mass of shell fish, two inches thick, upon the blades, with now and then a cluster of oysters jutting out, about two inches more, and an occasional bunch of grass a few inches long.

Now, as this was the state of the propeller, which had been frequently turned over, what must be the condition of the hull? A short time ago, with 20 pounds of steam, and making 40 revolutions, we averaged about three knots; under the same steam and revolutions we could formerly make six knots.

It is claimed for the "Davis composition" that it will keep vessels from fouling. It has not acted thus in this instance. On the contrary, I think that this vessel fouled faster than would have been the case had either white or red lead been used on her hull.

J. W. A. NICHOLSON, Commander.

Steam Plows Wanted in Louisiana.

MESSRS. EDITORS:—I have seen noticed several times in the SCIENTIFIC AMERICAN the steam plow, which is being profitably used in England and South America. Such plows are much needed in Louisiana, on our sugar and cotton plantations, where deep plowing is of the greatest importance. The plan most common among our best planters is to plow with four mules and two men, one to drive and one to hold the plow. Two acres per day, four inches deep, is a good day's work. Could we plow ten or twelve inches the yield in sugar would be double. Will Northern men send us the plows on such terms that we can buy them, say one-half cash and one-half mortgage? I am confident a number could be sold if they were here. PLANTER.

New Orleans, La., Nov. 16, 1864.

Trial of the Ames Gun.

MESSRS. EDITORS:—In an article on page 325, current volume of the SCIENTIFIC AMERICAN, entitled

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"The Ames 'Union' Gun a Practical Triumph," signed J. G. R., the writer takes occasion to speak of "four shells (with an improvement upon them) weighing from 110½ to 112 lbs.," which he says "were of the Stafford pattern." This statement is entirely incorrect. The four shells mentioned were not of the Stafford pattern, nor in any way similar to them. They are made on an entirely new plan, of which I am the inventor and patentee. The improvement consists in the sabot and mode of applying it, which increases the range and accuracy of the projectile, especially in guns like those of Mr. Ames, where large charges of powder are used. The two sub-caliber shot, also mentioned, were made by me, and under my patent. I have just finished a long course of experiments, occupying a space of four years, in which I have been entirely successful. I have sold all my patents to "The Bridgeport Steel Projectile Company," located in Bridgeport, Conn., who are making extensive arrangements to manufacture projectiles under my patents. Your correspondent was probably misinformed. By simply giving this letter a place in your columns you will oblige one of your old subscribers.

WILSON H. SMITH.

Birmingham, Conn., Nov. 26, 1864.

Flying of the Albatross.

MESSRS. EDITORS:—I would suggest to experimenters, constructing flying machines, a careful study of the form, structure and movements of the albatross. When in motion there is probably no bird, proportioned to his size and weight, that flies with less muscular power. With no other than a scarcely perceptable, though rapid, motion of the feathers that extend along the lower edge of the wings, he is able to maintain a current of air commensurate with his velocity; which current, acting like a wedge on the concave inclined surface of the under side of the wings, supports him for hours in his elevated position. Yet the albatross, though he seems to fly with so much ease, exhibits much difficulty in rising and alighting in a calm. In rising he goes floundering off, beating the water with his feet and wings for several hundred yards before he can attain sufficient hight and velocity to support himself in the air with motionless wings; and, in alighting, he does well if he can manage to overcome his inertia within fifty yards of his objective point; he must then stop, look about, and approach his object by swimming.

But in the regions usually inhabited by the albatross, calms are of rare occurrence; strong gales generally prevail; when, to rise, it is only necessary to turn his head to the wind, spread his wings, set his propellers in motion, and, with one vigorous spring with his feet, he is off. To change his course, a slight motion of the head and tail to one side changes the center of gravity; one wing is depressed, the other elevated, when the course is changed to the direction indicated by the depressed wing. It appears to me that the main difficulty to be encountered in flying with a machine constructed in imitation of the albatross, is to be found in overcoming the inertia of rising and alighting. This difficulty may perhaps be obviated by means of an elevated platform attached to an engine capable of attaining to a high degree of velocity, placed upon a circular railway, having considerable radius to the circle.

G. W. G.

Combination Type.

Some gentlemen engaged in the work of bringing a type-setting machine to perfection, have undertaken to ascertain what words in our language occur most frequently. They have taken ten thousand words from ten different authors, and by a careful count have ascertained how many times any word at all in the composition is given in the whole course of it. The word "the" occurs most frequently. One of the examples taken was the Review of the Week from the *Traveler*, and there the word "the" occurs more frequently than in any other. They have also ascertained, in the same way, the number of times all combinations of letters occur in the examples taken. They have then selected twenty-three from those which occur most frequently, and they propose to have these—such as "the," "and," "ion," "ing," "en," "er," etc., cast as single types, thus saving time and labor. This latter improvement is likely to have a trial without waiting for the new machine.—*Springfield Union.*

["Some gentlemen" can save their time and money by addressing Mr. Tobitt, of this city, who has used such type for many years.—EDS.

RECENT AMERICAN PATENTS.

The following are some of the most important improvements for which Letters Patent were issued from the United States Patent Office last week; the claims may be found in the official list:—

Process of Amalgamating Gold and Silver.—This invention consists in the construction and arrangement of certain mechanical devices for utilizing the process of amalgamating gold and silver by means of the distilled vapor of quicksilver. The ore, in a pulverized state, is fed from a hopper into a rotating or oscillating and inclined cylinder, into which also is fed a current of the vapor of quicksilver distilled in a retort set near the hopper. The said vapor thoroughly permeates the agitated mass of pulverized ore and amalgamates with the particles of gold and silver, whose surfaces are exposed to it, becoming condensed in the course of the operation and the whole mass is passed from the cylinder into an ordinary "Arastra," where it is worked in water by skids or drags in the usual manner of operating that machine. Henry W. Adams, of New York city, is the inventor.

Apparatus for Separating Quartz.—This invention consists in the employment of two crushing wheels, each provided with a series of cogs and intervening cavities, and placed in such relation to each other that they mesh into each other like cog wheels, so that a rotary motion imparted to one of said wheels is transmitted to the other without the use of gear wheels. This is done in such a manner that quartz or any other substance thrown between said crushing wheels is gradually drawn in and crushed between the cogs of one and the cavities of the other. Furthermore, by the difference in the velocity of the crushing surface of the cogs and that of the cavities in passing each other, a grinding effect is produced which facilitates the crushing operation in a great measure. These crushing wheels are provided with projecting side flanges to prevent the substance to be crushed and that already crushed from getting between the journals and journal boxes. Andrew Buchanan, of Brooklyn, N. Y., is the inventor.

Brush Handle.—This invention relates to an improvement in wire brushes, such as are generally used for cleaning off castings. These brushes are generally made by tying a number of wires together until a bunch is obtained of sufficient thickness for a brush. One end of this bunch forms the handle, and the other end, in which all the ends are left open and not fastened together, forms the brush. A brush of this kind can be used until it is worn down to the handle, but that portion of the wire which forms the handle is mere waste, and large quantities of wire are thus wasted and thrown away as useless. To obviate this waste which, particularly with the present high price of wire, is of considerable account, is the object of this invention. It consists in the employment, for the purpose of holding a wire brush, of a hook or loop projecting from a shank which is secured in a suitable handle and to which two jaws are hinged in such a manner that when the shank is taken out of the handle, and the jaws are opened, the wire which is intended for the brush can be readily wound round the hook or loop, and when the shank is introduced into the handle, the jaws, by coming in contact with the edges of the ferrule, are closed, and the wire is firmly and securely confined, and a brush is obtained which can be used up to within a short distance from the hook or loop. Fred. Rudolph and Wm. Kasefang, of Jersey City, N. J., are the inventors.

Street Railway Cars.—This invention relates to an improvement in the construction of cars for street railways, commonly termed horse cars, and it consists in a means employed for bracing the bodies of the cars by which the permanent form of the cars is maintained and its durability greatly promoted. The bodies of these cars are supported on two axles necessarily located near the center of the body, and the tendency of the overhanging ends is to droop, distorting the form, and diminishing the strength of the structure. To prevent this, various methods have been adopted, among which is the truss or arc rod, fastened at the ends and strained taut by studs with adjusting screws located over each axle. This plan has not been successful because the methods for securing the ends of the rods have been insufficient, a difficulty fully obviated by this invention. John Stephenson, of New York city, is the inventor.

Machine for Scutching Tangled Flax.—This invention consists in the use of scutching blades attached to radial rotating arms in such a manner that they will yield or give, and thus be enabled to perform their work in a much more efficient manner than if arranged fixed or stationary. The invention also consists in an improved feeding device for feeding the flax to the cutters, the same consisting of a pressure roller and a concave, whereby the flax may be fed uniformly to the scutching blades. The invention also consists in the means employed for adjusting the scutching blades nearer to or further from the concave as may be required; and it consists further in the employment of a screen to separate the woody matter from the fiber. William C. McBride, of Raritan, N. J., is the inventor.

Self-acting Pulley Brake.—The object of this invention is to dispense with the necessity of "belaying" during the process of hoisting and lowering with tackle and falls, and to prevent the occurrence of those accidents which are frequently caused by a loss of control over heavy weights, such as scaffolds, ships' sails, merchandize, etc., while suspended during the operation. It consists of a spherical wedge, fitted between a groove in one end of the body of the block and the unoccupied portion of the corresponding groove in the circumference of the sheave, having a spiral spring attached and passed through the space between the grooves, when, by a small degree of stretching, the end of the spring is hooked upon a pin which is fixed into the opposite end of the first-named groove for that purpose, so that the tension is just sufficient to prevent the wedge from falling out of place and to render it susceptible of being acted upon by the sheave which revolves freely while hoisting, throwing off the brake during the process; but upon the slightest indication of a backward revolution of the sheave the brake is drawn firmly between the grooves, performing the function of a "chock," when the sheave is stopped and a small proportion of the hoisting power is sufficient to sustain or lower a weight, as in the latter case the rope glides over the sheave at the will of the operator. A weight which two men can lift with the ordinary tackle, requires a third man to "take in the slack" by the process of belaying, which cannot always be conveniently done, and often magnifies the danger of accident rather than preventing it. By the use of the above invention the third man is not required for a similar weight; his hire is thereby saved and the labor reduced. This brake is exceedingly simple and does not require a peculiarly-constructed pulley for its application, as is the case with other inventions of this class, which renders them expensive, complicated and liable to get out of repair, but may be applicable to any of those which are in use at the present time in a few minutes without altering or disjointing the block. The inventor of this device is John Jochum, of Brooklyn, N. Y.

An Immense Establishment.

The Cambria Iron Works, at Johnstown, Pa., are being enlarged, though already the most complete and extensive establishment of the character in the country. These works give employment to about two thousand five hundred workmen, whose labor produces every week an average of over eight hundred tuns of railroad iron. The ore and coal necessary to produce this iron are taken out of the hills surrounding Johnstown, to the large and seemingly inexhaustible deposits of which the location of the rolling mill at that place is due. The monthly payments of the proprietors of the rolling mill to their employees, to neighboring farmers, lumbermen, etc., amounts to about one hundred thousand dollars, nine-tenths of which sum passes at once through the channels of home trade.

A GENTLEMAN went into a store in Manchester, N. H., recently, and inquired for small copper-toed shoes. The shopman immediately ordered him off, saying that this was no time or place to talk politics

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Forging Iron by Hydraulic Rams.

Some time ago Mr. Henry Bessemer patented a highly ingenious form of hydraulic press for forging metals. An ordinary ram of a hydraulic press is in communication through a pipe with the usual force-pump plunger, driven with a crank on a shaft provided with a heavy fly-wheel. The barrel, in which is working the plunger, is unprovided with valves, and is continued as a simple pipe till it communicates with the cylinder of the press. The water between the plunger of this kind of pipe and the ram thus acts as a communicator of motion between the two, and they rise and fall through distances varying respectively as the areas of the plungers. It will be seen that the heavy fly-wheel does the principal work in compressing; for as soon as the rams—the propelling plunger and the driven plunger—meet with resistance, the inertia of the heavy fly-wheel at once comes into play. We do not know whether this invention has been found successful in practice; and a yet more recent patent of Mr. Bessemer embodies the plan of supporting the bearings of the bottom roll of mills for rolling armor plates on a hydraulic ram. This ram is in communication with water pressure, which can be let on or off, as required, by means of a valve. In case the armor plate being rolled should stick—as often takes place—the water below the ram is let out, with the result of relieving the plate from pressure.

It is scarcely possible to over-estimate the importance of the application of the hydraulic press for forging purposes, and it may be ranked almost as high in the scale of practical improvements in working iron as the introduction of the rolling mill, and at least as high as the introduction of the steam hammer. It would seem to fit in with the recent inventions, giving us a command over the production of steel in large masses, affording, as it does, means of working a substance of much more delicate manipulation than even wrought iron. Nor does the use of the hydraulic press seem to be confined to working of iron and steel in an incandescent state, as is evidenced in the remarkable production of steel tubes drawn cold by hydraulic pressure.—*London Engineer.*

Curiosities of French Restaurants.

The Paris correspondent of the London *Star* writes as follows:—

"Restaurants for the working classes in Paris have now-a-days resource to every species of invention to attract attention. One has just been opened in the Faubourg Montmartre, which promises a dinner of two courses and a desert to whoever writes, in a legible hand, the answer to a rebus offered every morning for solution by the *dame de comptoir*. Another, in the Faubourg St. Antoine, hit on a still more strange expedient. He chose for his ensign a gigantic golden sausage, which he swung enticingly over the door of his restaurant, the words *'A la saucisse d'or,'* in huge gold letters blazing beneath. His *salon* was large, its white walls decorated by festoons of the tempting edible so highly appreciated on the other side of the Rhine, and in every fiftieth sausage a five-franc piece in gold. His principle was, that as his customers called for sausages, they should be cut off in regular rotation from the string, so artistically arranged around the dining hall. The result may be better imagined than described. The eager anxiety depicted on the countenance of every *ouvrier* as he nervously examined and finally ate the sausage, would have supplied a physiognomist with many good subjects for study. The expedient proved most remunerative to the proprietor, but the quarrels that ensued were of so serious a nature that the police have interfered, and the master of the establishment has received orders either to shut up his shop or to proceed on a less exciting system."

Free Lecture on Maryland.

By the proceedings of the Farmers' Club, it will be seen that Mr. Bayard is to deliver an address at the next meeting on the advantages which Maryland offers to Northern farmers who are seeking a more genial climate. Mr Bayard has devoted a great deal of time and labor to the investigation of the subject, and will doubtless give an instructive address. The meeting commences at 1½ o'clock, P. M., on Tuesday, Dec. 6th, at Room 24, Cooper Institute, and all who are interested are invited to attend.

Postal Money Orders.

The Post-Office Department has completed the system of using postal money orders; they can be had at a trifling expense at the principal post offices throughout the United States. This is one of the safest and most economical methods of remitting money. We therefore advise our correspondents, when remitting subscriptions and patent fees, to purchase these orders whenever they can conveniently do so, as it is impossible for the sender to lose his money. For the convenience of our readers we publish a list of offices where orders can be obtained. It will be a useful table of reference, and we hope our patrons will make free use of it in their correspondence with us.

Office.	*State.*	*Office.*	*State.*	*Office.*	*State.*
Albany	N. Y.	Honesdale	Penn.	Philadelphia	Penn.
Albion	N. Y.	Hudson	N. Y.	Pittsburgh	Penn.
Alexandria	Va.	Indianapolis	Ind.	Pittsfield	Mass.
Alton	Ill.	Jersey City	N. J.	Plattsburg	N. Y.
Annapolis	Md.	Johnstown	Penn.	Portland	Me.
Auburn	N. Y.	Kalamazoo	Mich.	Port Royal	S. C.
Augusta	Me.	Keene	N. H.	Portsmouth	N. H.
Baltimore	Md.	Keokuk	Iowa.	Portsmouth	Ohio.
Bangor	Me.	La Crosse	Wis.	Pottsville	Penn.
Beloit	Wis.	Lafayette	Ind.	Poughkeepsie	N. Y.
Binghampton	N. Y.	Lansing	Mich.	Providence	R. I.
Bloomington	Ill.	Lewistown	Penn.	Quincy	Ill.
Boston	Mass.	Lexington	Ky.	Racine	Wis.
Bridgeport	Conn.	Lima	Ohio.	Reading	Penn.
Brooklyn	N. Y.	Lockport	N. Y.	Red Wing	Minn.
Buffalo	N. Y.	Louisville	Ky.	Rochester	N. Y.
Burlington	Vt.	Lowell	Mass.	Rockford	Ill.
Burlington	Iowa.	Lynn	Mass.	Rock Island	Ill.
Cairo	Ill.	Madison	Ind.	Rutland	Vt.
Chattanooga	Tenn.	Madison	Wis.	Saint Louis	Mo.
Chicago	Ill.	Manchester	N. H.	Saint Paul	Minn.
Chilicothe	Ohio.	Marietta	Ohio.	Salem	Mass.
Cincinnati	Ohio.	Meadville	Penn.	Sandusky	Ohio.
Cleveland	Ohio.	Memphis	Tenn.	Saratoga Sp'ngs	N. Y.
Columbus	Ohio.	Milwaukee	Wis.	Scranton	Penn.
Concord	N. H.	Montpelier	Vt.	Sheboygan	Wis.
Cumberland	Md.	Muscatine	Iowa.	Springfield	Mass.
Davenport	Iowa.	Nashua	N. H.	Springfield	Ill.
Dayton	Ohio.	Nashville	Tenn.	Syracuse	N. Y.
Des Moines	Iowa.	Newark	N. J.	Terre Haute	Ind.
Detroit	Mich.	New Bedford	Mass.	Toledo	Ohio.
Dubuque	Iowa.	Newbern	N. C.	Trenton	N. J.
Easton	Penn.	Newbergh	N. Y.	Troy	N. Y.
Eastport	Me.	New Castle	Penn.	Urbana	Ohio.
Elgin	Ill.	New Haven	Conn.	Utica	N. Y.
Elmira	N. Y.	New London	Conn.	Vicksburg	Miss.
Erie	Penn.	New Orleans	La.	Vincennes	Ind.
Evansville	Ind.	Newport	R. I.	Washington	D. C.
Fall River	Mass.	New York	N. Y.	Watertown	N. Y.
Fort Wayne	Ind.	Norfolk	Va.	Wheeling	W.Va.
Frederick	Md.	Norwich	N. Y.	Williamsport	Penn.
Freeport	Ill.	Ogdensburgh	N. Y.	Wilmington	Del.
Galena	Ill.	Old Pt Comfort	Va.	Winona	Minn.
Grand Rapids	Mich.	Oswego	N. Y.	Wooster	Ohio.
Harrisburg	Penn.	Ottowa	Ill.	Worcester	Mass.
Hartford	Conn.	Peoria	Ill.	Xenia	Ohio.
		Zanesville			Ohio.

RATES OF COMMISSION CHARGED FOR MONEY ORDERS.—Ordersnot exceeding $10, 10 cents; over $10 and not exceeding $20, 15 cents; over $20and up to $30, 20 cents, No single order issued for less than $1 nor more than $30. Parties desiring to remit larger sums must obtain additional Money Orders. Coin, United States Treasury Notes or National Bank Notes only received or paid.

The Decay of Conversation.

The ancient art of talking is falling into decay. It is an ascertainable fact that, in proportion to an increased amount of population, the aggregate bulk of conversation is lessening. People now-a-days have something else to do than talk; not only do they live in such hurry that there is only leisure for just comparing ideas as to the weather, but they have each and all a gross quantity to do, which puts talking out of the question. If persons remain at home, they read; if they journey by rail, they read; if they go to the seaside, they read; we have met misguided individuals out in the open fields with books in hand; young folks have been seen stretched underneath trees, and upon the banks of rivers, pouring over pages; on the tops of mountains, in the desert, or within forests—everywhere men pull printed sheets from their pockets, and in the earliest, latest, highest occupations of life, they read. The fact is incontestibly true, that modern men and women are reading themselves into a comparatively silent race. Reading is the great delusion of the present time; it has become a sort of lay piety; according which, the perusal of volumes reckons as good works; it is, in a word, the superstition of the nineteenth century.—*Chambers' Journal.*

A CANAL BOAT ARMED WITH A GATLING GUN.—Canal boats in North Carolina are armed with the Gatling gun as a protection against guerillas. The Gatling gun is a novel piece of ordnance; it consists of six chambers, which are made to revolve around a central barrel by means of a crank. The charges are poured into a hopper, and the gun is self-loading. It will throw from seventy-five to one hundred balls per minute, the number of discharges depending upon the speed with which the crank is turned. Officers here speak confidently of the success and effectiveness of this novel piece of ordnance; so that if the guerillas interfere with the *Gazelle*, they will be greeted with a continuous shower of bullets. All the boats that ply on the canal will hereafter be furnished with the Gatling, or, as the irreverent term it, the "coffee-mill" gun.

Foreign Patent—Motive Power.

This invention relates to a mode of relieving the ordinary slide valve employed in steam and other motive power engine cylinders from pressure to any practical extent without materially increasing the rubbing surface. And for this purpose it is proposed to apply two slide valves, placed back to back, working on double ports, each set of ports being only half the area required for any size of cylinder. Thus two valve faces, with two sets of ports merging into one port leading to each end of the cylinder, would be adopted, or the ports from the two faces may pass forward separately into each end of the cylinder; or, the two valves and ports from the same may be so arranged that a full-sized steam port may pass from one valve to one end of the cylinder, and another full-sized steam port from the other valve to the opposite end of the cylinder, each valve face having one steam port and one eduction port.

SPECIAL NOTICE.

JUNIUS JUDSON, of Rochester, N. Y., has petitioned for the extension of a patent granted to him on March 4, 1851, for an improved power governor.

It is ordered that the said petition be heard at the Patent Office, Washington, on Monday, Feb. 13, 1865.

All persons interested are required to appear and show cause why said petition should not be granted. Persons opposing the extension are required to file their testimony in writing, at least twenty days before the final hearing.

The "Scientific American" a Religious Paper.

A writer in the *Oneida Circular* asks:—"Are not the honest mechanics, the practical men of science, who are the obedient servants of truth and principles, to become the real preachers of gospel truth? Are not such periodicals as the SCIENTIFIC AMERICAN, *Country Gentleman*, and kindred publications, more truly the organs of the gospel of Christ and the spirit of the Bible, than so-called religious papers in general?"

Our contemporary is one of those "who find sermons in stones. books in the running brooks, and good in everything.

Crab-apple Cider.

In response to an article on the manufacture of cider which recently appeared in these columns, Mr. H. L. Physick, of Port Deposit, Maryland, has sent to this office a specimen of cider which he made this fall from the Hewes Virginia crab-apple. It is superior to anything in the cider line we have tasted this year.

THE IRON-CLADS "ETLAH" AND "SHILOH."—The *Etlah* and *Shiloh* are light draft monitors with Ericsson turrets, built under the supervision of D. G. Wells, Esq., Engineer, at St. Louis, Mo., on behalf of Government. They each carry two guns, one 11-inch Dahlgren, and one 150 pounder rifle Parrott. Extreme length, 225 feet; breadth of beam, 45 feet; depth of hold, 11 feet; thickness side armor, 3 inches; thickness deck armor, 1 inch; internal diameter turret, 20 feet; thickness turret, 8 inches; internal diameter pilot house, 6 feet; thickness pilot house, 10 inches; number of motive engines, 2; diameter of cylinders, 22 inches; length of stroke, 30 inches; propellers, 2; diameter of propellers, 9 feet.

A $50,000 MUSKRAT.—The late breach in the Erie Canal, near Rochester, which summarily closed the canal for the season and inflicted a damage of some $50,000 on the State, is thought to have been caused by a muskrat. The canal runs through a swamp at that place, and the theory is that his muskratship bored the bank and let out a small stream, the water gradually enlarging the hole until the bank gave way, when the rush of waters set in. This shows that little things—even muskrats—are not to be despised.

HEAVY PATENT SUIT.—A suit is pending in the U. S. District Court for the Southern district of New York, between Professor Daniel Treadwell and Robert P. Parrott, in relation to the right of making the hooped cannon which are generally known as the Parrott gun.

THE Adams Express has carried 60 tuns of Thanksgiving gifts to the soldiers from Boston.

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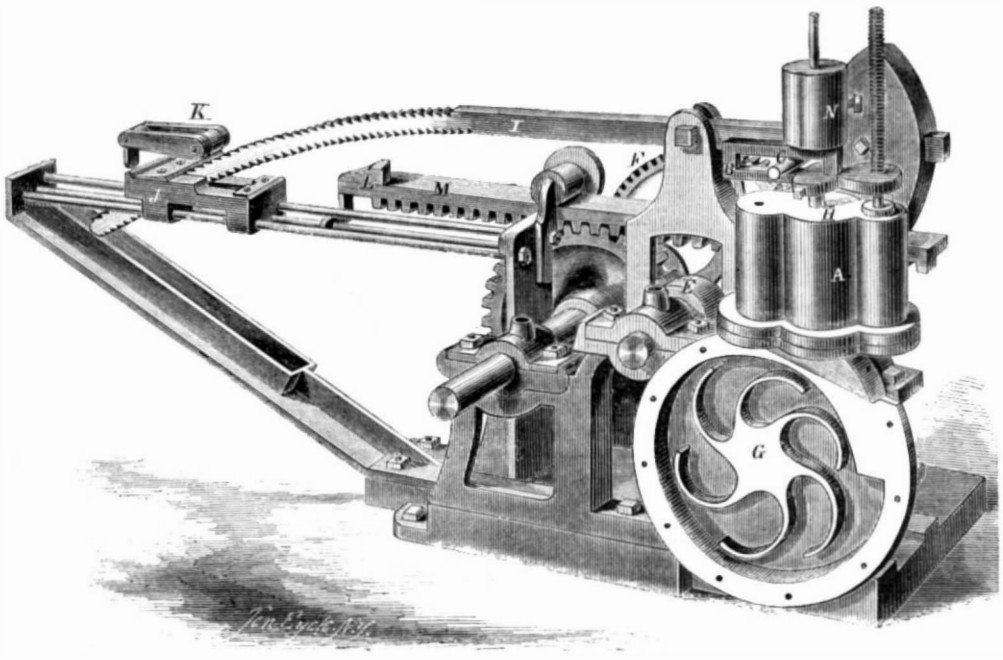
Improved Water-wheel Governor.

This machine is designed to regulate the quantity of water admitted to water-wheels of any description, and thereby cause them to run at a steady velocity. The principle involved in this machine is that of a piston resting on a column of liquid—oil by preference—said column being supplied continually by a centrifugal pump working directly below the piston. In the engraving the oil cylinder is A, and the piston rod has a slotted yoke, B, which the pin, C, of the vibrating lever works in. This lever vibrates on a center by the action of the eccentric, E, which, in turn, is driven by gears, F. The fan, G, in the pump raises the oil to the piston above through suitable openings in the pump chamber, and the oil is continually supplied to the fan through other openings not shown.

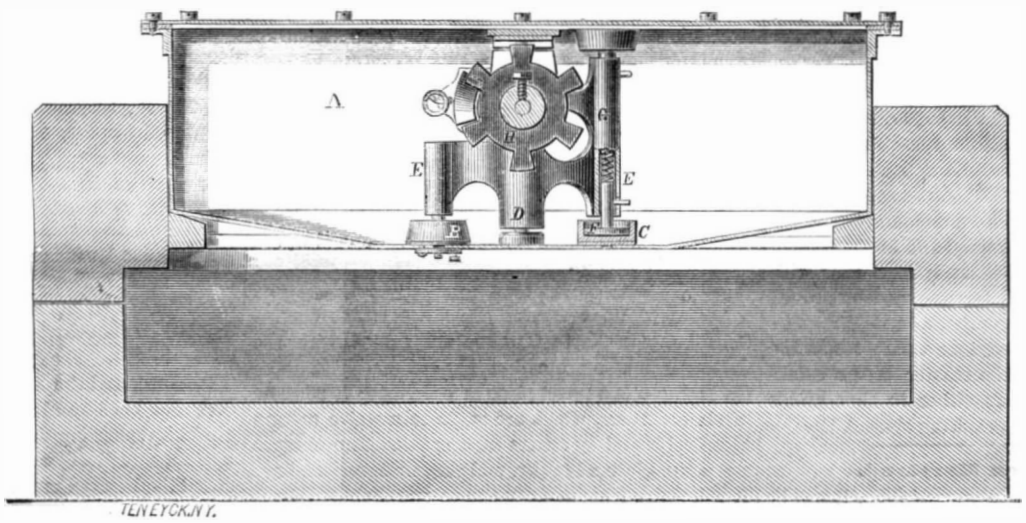


GILLESPIE'S WATER-WHEEL GOVERNOR.

When the fan is driven at a certain velocity by a belt or gears, the piston on the rod, H, stands at a fixed point, and the bar, I, which has ratchet teeth cut on one end, pushes the carriage, J, out to a stated point on the slides. The catch, K, hooks over the stud, L, on the rack, M, which is in direct communication with the gate of the penstock, so that as the bar, I, works, it advances or moves back the carriage, J, thus completely controlling the velocity of the water-wheel to which the apparatus is attached. When the catch, K, is thrown back, as in the engraving, the gate is disconnected from the governor, one revolution of which will completely open or shut the gate. An advantage in this machine is, that it is always in gear to shut the gate, so that if the latch is not dropped, through carelessness, the wheel can never run too fast. The inventor states that it will run the gate from wide open to shut close, in six seconds. The velocity of the wheel, for a certain speed, is regulated by applying weights, N, to the cross-head so as to increase the resistance to the piston. Many of these governors are now in use, and have been giving great satisfaction for two and a half years. Governors for steam engines are also made on the same principle. Patented by J. E. Gillespie on the 7th of January, 1862. For further information address the agents, Messrs. Oliver Brothers & Co., 45 Liberty street, New York.

Oil-stone Fountain.

This convenient article is one that will supply an existing want, which is to have the oil always at hand so that it can be used immediately on oil stones. By the use of it, also, the exact quantity of oil required is dropped on the stone, so that the surface of the latter is kept clean and free from gum, for if just as much as is required is put on the stone, it will be all used and no waste will occur. This fountain is constructed as follows:—The metallic fountain, A, is set in the top of the oil-stone box within a short distance of the stone. In the bottom of the fountain there are two apertures covered by cork-faced valves, B and C. These valves are attached to the casting, D, which is in one piece, and has the arm, E counter-bored to let a spring play in them. These springs keep the valves tight against the bottom of the fountain, through the agency of the plungers, F. The arm, G, on the casting, D, has its upper end extended so as to form another valve similar to those below. This valve covers an aperture for the admission of oil to the fountain; but there must be another hole in the top, in addition, to let the air in the fountain out, as the oil is poured in. By the action of the wheel, H, the arms of which are cam-shaped on the back, and strike similar cam faces on the casting, D, the valves are moved away from the openings beneath them, and quickly closed again by a spring (not shown) attached to the casting, D. The wheel, H, is on a shaft which runs through the box; it has a milled head on the outside to be turned by the thumb and finger. This operation lets one drop of oil issue from each valve at the bottom at a time, so that the quantity is very perfectly regulated. Thick and heavy oils can be used in this fountain, for it can be set on the stove and heated without injury. The several parts of this mechanism are quite simple and few in number. When properly made they will not get out of order in a long time. This oil stone will no doubt command a ready sale among wood-workers.



FUNK'S OIL-STONE FOUNTAIN.

It was patented through the Scientific American Patent Agency on the 19th of April, 1864, by James Funk, of Beverly, Ill. For further information address the inventor as above. [See advertisement on another page.

THE new 10-cent postal currency will be printed on paper made of corn husks.

A NEW SCIENTIFIC SOCIETY.

A movement is on foot for the establishment, in this city, of a new scientific association, which, if properly managed, may exert a great, beneficent and long-enduring influence. A meeting for organization was held at room 24 of the Cooper Institute, on Tuesday evening, November 29th. Dr. John H. Griscom was chosen chairman, and a committee was appointed to draft a constitution with instructions to report on Tuesday, Dec. 6th.

Abraham Hewett, Esq., stated that, by the terms of the trust deed of Peter Cooper, conveying the building in which the meeting was assembled to the Trustees of the Cooper Union, provision was made for the formation of such a society, requiring that the large hall of the Cooper Institute should be appropriated one evening in every week, free of charge, for its meetings. Mr. Hewett, on the part of the Trustees, invited the gentlemen present to organize under that provision. The committee on organization were accordingly instructed to confer with the Trustees of the Cooper Union.

The meeting was in some respects very promising, and in others very unpromising. The room was nearly filled, the appearance of the men was remarkably intelligent, several who addressed the meeting are admirable speakers, and certainly no more dignified, courteous, intelligent and in all respects able, presiding officer could be found than Dr. Griscom. If he can manage to obtain the earnest co-operation of men like himself, of learning and character, the meetings will be largely attended, and the society will command the respect of the community and will exert a very powerful influence.

But among the active promoters of the new organization were several men who are far more fond of hearing their own sweet voices than they are of interesting the people to whom they are talking. By their long-winded papers and speeches before the Farmers' Club and Polytechnic Association, they have made themselves such insufferable bores to those societies that the members refuse to listen to them, or listen with extreme impatience. They occupied a large share of the time on Tuesday evening; one of them introduced his dry hobby, "meteorology," and another craved the courtesy of the audience for time to "pitch into the mathematicians." Unless some device can be found for putting a bridle upon the tongues of these men, the meetings of the new society will make a sorry appearance in the great hall of the Cooper Institute.

A REMARKABLE OIL STRIKE.—We understand that Messrs. Pennock, Ball & Co., of this city, who, for several months past, have been sinking a well on Buck Run, not far from Zanesville, Ohio, are now obtaining one hundred and sixty barrels of oil a day. Its specific gravity is said to be thirty, and is selling at twenty-four dollars per barrel at the well. This is one of the most remarkable strikes in the history of oil.—*Pittsburgh Commercial.*

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VOL. XI. NO. 24....[NEW SERIES.]....*Twentieth Year.*

NEW YORK, SATURDAY, DECEMBER 10, 1864.

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WHAT CAN BE DONE FOR INVENTORS.—ADVICE GRATIS AND ADVICE FOR PAY.

For the information of Inventors, we would state that it is the custom, at the office of this paper, to examine models or drawings and descriptions of alleged new inventions, and to give written or verbal advice as to their patentability, without charge. Persons having made what they consider improvements in any branch of machinery, and contemplate securing the same by Letters Patent, are advised to send a sketch or model of it to this office. An examination will be made and an answer returned by early mail. Through our Branch Office, located directly opposite the Patent Office in Washington, we are enabled to make special examinations into the novelty and patentability of inventions. By having the records of the Patent Office to search, and the models and drawings deposited therein to examine, we are enabled to give an inventor most reliable advice as to the probabilities of his obtaining a patent, and also as to the extent of the claim that it is expedient to set up when the papers for an application are prepared. For this special examination at the Patent Office we make a charge of Five Dollars. It is necessary that a model or drawing and a description of the invention should accompany the remittance.

The publishers of this paper have been engaged in procuring patents for the past eighteen years, during which time they have acted as Attorneys for more than TWENTY THOUSAND patentees. Nearly all the patents taken by American citizens in FOREIGN countries are procured through the agency of this office.

Pamphlets of instructions as to the best mode of obtaining patents in this and all foreign countries are furnished free on application.

For further particulars as to what can be done for inventors at this office, see advertisement on another page, or address

MUNN & CO.,
No. 37 Park Row, New York.

THE "SCIENTIFIC AMERICAN" FOR THE ENSUING YEAR.

On the first day of January next we shall commence Volume XII. of the New Series of the SCIENTIFIC AMERICAN, and we scarcely need to remind our readers that in the present state of Journalism in this country, things are so much changed by the exigencies of the war, that publishers are compelled to carry burdens almost too heavy for them.

In spite, however, of these burdens, which we confess to have felt to some extent by a decreased profit for our labor, we have maintained the standard of the SCIENTIFIC AMERICAN equal to that of any previous year. The paper we believe has lost none of its old renown; indeed, if we may trust to the judgment of many of our oldest readers, we may well cherish the conviction that it was never before so well edited. We are conscious, at least, that our labors in this particular have never been more earnestly directed to gratify our readers. The valuable information published in the SCIENTIFIC AMERICAN can not be obtained from any other journal. In the volume now closing the mechanic will find that special attention has been paid to his interests; the manufacturer will observe many hints on workshop economy, new fabrics, systems and schemes, the inventor and patentee will find the fullest and earliest intelligence on all that belongs to his peculiar calling; and the general reader will observe that all the great industrial enterprises, all the newest and best plans for ordnance, torpedoes, small arms, steam engines and telegraphing are noticed and discussed. Articles on the large manufactories have been illustrated also, and described at length.

The SCIENTIFIC AMERICAN has had early intelligence of every rebel iron-clad of note, and also descriptions of our own monitors, and illustrations of the Government ordnance, and experiments on iron-clad targets. The great question of the expansion of steam has again arisen, and is still being tested. The Hecker and Waterman experiments, as well as those of Government, are yet under way; and the partial results of the former have already been published. Illustrated articles on machinists' tools, as well as practical rules and hints, will be found in the approaching volumes. The first volume will open with an article on "Lathe Tools," in which all the newest and most approved forms, as well as the work to which they are adapted, will be lavishly illustrated. The attractions, past and forthcoming, of the SCIENTIFIC AMERICAN, render it indispensable to every workshop, and we intend that it shall be welcome at the fireside.

IMPROVEMENT IN PHOTOGRAPHY.

We recently published an account of a new discovery in photography, by Jacob Wothly, of Germany, by which printing upon paper by means of the salts of Uranium had been successfully accomplished. The prints were stated to compare favorably in appearance, and in every other respect, with the pictures ordinarily produced upon albumenized paper and the salts of silver.

The discovery of Wothly was immediately bought up by a company of gentlemen in London, who had made it the basis for a joint stock concern having a very large capital. Letters Patent have been obtained in Great Britain, and we presume that measures have been taken to secure patents in this and other countries. But until the patent is granted here all our photographers are at liberty to make use of the process, and for their convenience we subjoin the following directions, extracted from the British specification:—

To one pound of plain collodion add from 1½ to 3 ounces of nitrate of uranium and from 20 to 60 grains of nitrate of silver.

The paper is prepared for printing by simply pouring the above sensitized collodion upon its surface, and hanging the sheets to dry in the dark.

The printing is accomplished by exposing the paper to light under the negative in the usual manner, and for about the usual time required for silvered paper; print until the desired depth is reached. It is not necessary, as in the ordinary process, to print the positive to a greater intensity of color than the fixed picture is intended to have.

After printing immerse the picture in a bath of acetic acid for about ten minutes, or until that portion of the salts not acted upon by the light has been dissolved. The picture is now fixed and finished by thorough washing or rubbing with a sponge or brush, or by rinsing in pure water; then dry. Changes in the tone of the picture to suit the taste may be made before drying, by using a bath of chloride of gold, or of hyposulphite of soda.

Such, in brief, is the new Wothlytype process. We have given it a few trials, with the most gratifying success. We presume that it will ere long be recognized among photographers as an established and excellent method of printing. It is not claimed that it surpasses the silver printing, but the superior convenience of the Wothlytype process will be a very strong reason for its employment, if the pictures it produces prove equal, or nearly equal, in durability and other qualities, to those resulting from the old method of printing.

The uranium sensitized paper, it is stated, can be preserved for an indefinite time in properly-prepared receptacles, from which light is excluded. This is another important advantage, as the common silvered paper loses its value soon after preparation.

The uranium prints, made as above described, have a smooth and glossy appearance. When an unglazed surface is desired the sensitive salts are dissolved in alcohol and water, adding some saccharine substance. The paper is then coated with the mixture.

The best results of the Wothlytype process ensue when a well-sized, fine and very hard-rolled paper is employed. It is recommended to coat the surface of the paper with a sizing of starch, arrow-root or gum tragacanth.

We shall frequently refer to this subject again, and intend to keep our photographic readers fully posted in regard to all the most useful details. In the meantime, the information here presented will enable them to give the new process a preliminary trial.

The holders of the Wothlytype patents are likely to realize immense sums as the proceeds of a very simple but most useful discovery. The patent claims rest chiefly upon the combination of the salts of uranium and silver.

THE ATTEMPT TO BURN THE CITY.

In our last number we briefly mentioned the attempt to destroy this city by fire, on the night of Friday, the 26th of November, by a band of depraved criminals. The plan of the villains was to set fire simultaneously to the principal hotels, and to such hay barges and lumber yards as they could reach. For this purpose they entered the hotels as lodgers, and piling the furniture in the middle of their rooms, covered it with turpentine and phosphorus, and set it on fire. In this way twelve of the principal hotels were fired, but fortunately, in every case, the flames were extinguished before they had obtained sufficient headway to destroy the building.

The failure in so many instances of a scheme apparently so well contrived, may inspire the feeling that it is impossible to burn down a great city. Several of the papers have remarked that the mistake of the criminals was in closing tightly the windows and doors of the rooms, by which an access of air was prevented, and the fire was smothered. This closing of the windows was doubtless a precaution on the part of the incendiaries to enable them to escape before the fires were discovered, as the saving of their necks was more important to them than the success of their fiendish scheme.

Had the knowledge of these incendiaries been equal to their wickedness, they could have secured an abundant supply of oxygen for their fires, without any opening of doors or windows. It is perhaps not advisable to point out the accessible and well-known substances which would have furnished a supply of oxygen, but it is advisable that the community should be warned of their existence, in order that proper precautions may be taken to frustrate any similar attempt that may be more intelligently planned.

DEATH OF PROFESSOR SILLIMAN.

Benjamin Silliman, LL. D., died at his residence in New Haven, Conn., on Wednesday, the 24th of November, in the 86th year of his age. He was born at North Hartford, Conn., Aug. 8th, 1779. His father was a lawyer of distinction, and served as a Brigadier General in the War of the Revolution.

Professor Silliman was educated at Yale College,

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where he graduated in 1796. He studied law, but was induced to abandon his profession and accept the new chair of chemistry at Yale in 1804. In 1818 he founded the *American Journal of Science and Arts*, and was its sole editor for twenty years.

The subject which most warmly enlisted Professor Silliman's sympathies, and to the elucidation of which he most zealously devoted his faculties, was the harmony of science and religion. In a course of lectures which the writer of this heard him deliver in 1834, he argued with almost passionate zeal that the word "day," as used in the beginning of Genesis, does not mean twenty-four hours, but an indefinite period of time; contending that this is conclusively shown in the sentence at the close of the account, "These are the generations of the heavens and of the earth when they were created, in the *day* that the Lord God made the earth and the heavens." Many years afterward, at the meeting of the American Association for the advancement of Science, at Providence, he argued with the same enthusiasm on his favorite topic. He said, "All the scientific men ask is *time*, and time the religious men are ready to grant." From his learning, his ability, his position, and his zeal, he was enabled, by showing the eternal harmony of the two, to render a service to both science and religion which will never be fully appreciated.

Professor Silliman was remarkable for his warm and genial nature; his life was an exemplification of the Christian virtues; and after doing more perhaps than any other man of his generation for the advancement and diffusion of knowledge, his long and useful career has been brought to a close amid the sorrow not only of his countrymen, but of all lovers of science throughout the civilized world.

OIL CUPS.

A most objectionable and wasteful practice of using oil cans, instead of oil cups, for lubricating machines, prevails extensively. It is objectionable because uncleanly, for one reason, and extravagant because too much oil is put on at once. A journal will carry only a certain quantity of oil, and all that is poured in after the surfaces are well covered, runs off at the nearest aperture. When oil cups are applied, and properly used, the bearing takes up all the oil admitted, and uses it economically; that which is now lost might be saved. By an oil cup we do not mean a simple brass funnel to guide the nose of the can to the proper place, but a cup with a wick and a tube, or the equivalent of this device, for feeding the oil at regular and proper times. The wick and tube is the one generally used, and it can be made to feed fast or slow according to the amount of oil needed.

The filthy drip pans placed under the hangers of shafting are entirely unnecessary, and should be dispensed with by using cups. Many a suit of clothes has been spoiled, and not a little profanity caused by the upsetting of these drip pans, and the descent of their contents on workmen when belts run off. Where oil cups are not used fully one-half the oil poured on the bearing runs out again; and, as a matter of economy, every manufacturer, of whatever class, should see that his engines, his lathes, shafting and similar machines and fixtures are furnished with oil cups that feed the lubricator to the journals, as fast or as slow as it is required.

Good Inventions in Demand.

There never was a time when really good inventions were in so great demand as now. Almost every day we are called upon to prepare assignments for parties who have recently obtained patents, and we have been surprised at the large prices which rights on some small, useful articles have commanded.

In another column may be found an advertisement of two brothers who wish to invest $10,000 in some new and useful improvement in the hardware trade. The advertisers are known to us to be men of integrity, and to mean what they say, so that parties having any patented article for sale which meets the requirements set forth in the advertisement may correspond with them in full confidence of honorable treatment.

A BOSTON firm has just put into operation, at Fisherville, N. H., a factory which transforms poplar wood into "excelsior," for filling mattresses, at the rate of two tuns per day.

MARKETS FOR THE MONTH.

The leading feature in the market for the past month has been the great fluctuation in the price of gold, which has ranged from 260 to 209⅞. As long as our currency is so inflated it will doubtless be subject to these disturbing fluctuations. The following table shows the prices of the leading staples, reckoned in our paper currency, at the end of October and November:—

	Price Oct. 26.	Price Nov. 30.
Coal (Anth.) ₩ 2,000 lb	$9 50@11 00	$9 00 @10 50
Coffee (Java) ₩ lb	45	50
Copper (Am. Ingot) ₩ lb	47@ 48	48 @ 49
Cotton (middling) ₩ lb	1 22	1 29 @ 1 30
Flour (State) ₩ bbl	$8 90@ 9 25	$9 65 @10 25
Wheat ₩ bush	$2 25@ 2 60	$2 50 @ 2 80
Hay ₩ 100 lb	1 30@ 1 35	1 45
Hemp (Am. drs'd) ₩ tun	320 00 @350 00	$320 00 @350 00
Hides (city slaughter) ₩ lb	10½@ 11	13½@ 14
India rubber ₩ lb	$1 10 @ 1 15	70 @ 1 15
Lead (Am.) ₩ 100 lb	$13 87 @14 00	$15 50 @16 00
Nails ₩ 100 lb	$9 50 @10 00	9 00 @10 00
Petroleum (crude) ₩ gal	46½@ 47	48
Beef (mess) ₩ bbl	$8 00 @13 00	7 00 @12 00
Saltpeter ₩ lb	24 @ 30	30
Steel (Am. cast) ₩ lb	18 @ 33	30 @ 34
Sugar (brown) ₩ lb	18 @ 21	16½@ 22¼
Wool (American Saxony fleece) ₩ lb	90 @ 1 00	90 @ 1 10
Zinc ₩ lb	20 @ 21	19 @ 20
Gold	2 16	2 30

FARMERS' CLUB.

The Farmers' Club of the American Institute held its regular weekly meeting at its Room at the Cooper Institute, on Tuesday afternoon, Nov. 29, the President, N. C. Ely, Esq., in the chair.

EMIGRATION TO MARYLAND.

The President read a letter from W. Bayard, Esq., of Maryland, in reply to an invitation from the Club, saying that he would be present at the next meeting, on Tuesday, December 6th, and would explain the advantages and disadvantages of Maryland as a place for immigration and settlement by Northern farmers.

OSAGE ORANGE HEDGES.

Solon Robinson read a letter from S. W. Noble, of Leroy, Ill., saying that though the tops of the Osage orange are occasionally killed by extreme cold in the winter, the roots are not injured, and the freezing does not impair in the least the effectiveness of the hedge. The roots throw up fresh sprouts, and the old stalks stand as a perfect fence till the new sprouts are grown.

THE BEST EARLY POTATO.

Mr. Carpenter gave it as his opinion, from extensive experience, that the Early Cottage is far the best and most profitable early potato.

CEDAR BIRDS.

Dr. Trimble, being called up, stated that the bird which eats such large quantities of canker-worms is the cedar bird, and that is what he called it before—not the reed bird. Besides the name of cedar bird, it is also called the cherry bird, the canker bird and the wax wing.

Dr. Trimble continued, "Mr. Chairman, I also said that the Baltimore oriole eats the curculio, and that I had found the head of one of these insects in the crop of a reed bird. I have here an agricultural paper in which the editor says that he does not believe that I know what a curculio is. I have wintered and summered with the curculio for the last 25 years. I have studied its habits, examined its structure, written upon it; I have probably killed more of the insects than all of the rest of the inhabitants of the United States. The curculio has a very large eye, containing, as nearly as I have been able to count under the microscope, 147 lenses, There is no other species of this class of wevils the eye of which has very nearly the same number of lenses. Some have very few, and some a great many more. Now, I found in the crop of a bobolink the proboscis and eyes of an insect that resembles the proboscis and eyes of the curculio. On bringing the eye into the focus of the microscope, I found that it contained 147 hexagonal lenses, and I think I am justified in stating that, at all events, one reed bird has eaten one curculio."

Many other subjects were discussed, but we select only the above.

THE *Country Gentleman* says that scraping the horns of oxen on the inside will make them curve outward, or *vice versa*.

ISSUED FROM THE UNITED STATES PATENT-OFFICE

FOR THE WEEK ENDING NOVEMBER 29, 1864.

Reported Officially for the Scientific American.

☞ Pamphlets containing the Patent Laws and full particulars of the mode of applying for Letters Patent, specifying size of model required and much other information useful to inventors, may be had gratis by addressing MUNN & CO., Publishers of the SCIENTIFIC AMERICAN, New York.

45,214.—Apparatus for amalgamating Gold and Silver. Henry N. Adams, New York City:

I claim, first, Amalgamating gold and silver contained in pulverized ores, tailings, or other metaliferous material, by means of quicksilver brought in contact therewith in the condition of vapor, under a mode of operation, substantially such as above set forth.

Second, The discharge of the distilled vapor of quicksilver from a still, and auriferous or argentiferous quantity or substances containing gold or silver in a pulverized state from a hopper into a rotary or oscillating and inclined cylinder or chamber, which is fed in a continuous stream with the said quartz or material from the said hopper, by means of the rotating or oscillating motion of the said cylinder or chamber, substantially in the manner and for the purpose set forth.

Third, The combination of the apparatus for supplying the retort with quicksilver with the retort, substantially in the manner and for the purpose specified.

Fourth, The combination and connection of the retort and the revolving or oscillating cylinder and chamber, by means of the worm, R, through which the distilled vapor of mercury is discharged from the retort with the said revolving cylinder or chamber, in the manner and for the purpose herein named.

Fifth, The stationary hopper, O, in combination with the rotating or oscillating cylinder or chamber, L, substantially in the manner and for the purpose mentioned.

Sixth, The partition of said hopper, O, with its aperture and plug, Q, in combination with said hopper, in the manner and for the purpose described.

Seventh, The stuffing-box, N, in combination with the feeding end of the rotating or oscillating cylinder or chamber through which it passes and in which it works, substantially in the manner and for the purposes set forth.

Eighth, The surrounding jacket pipe, a, in combination with that part of the worm which passes through the hopper, in the method and for the object designated.

Ninth, The mode of sealing the upper or feeding end of the rotating or oscillating cylinder or chamber by plunging it directly into the pulverized quartz or gold or silver bearing substance contained in the hopper and allowing it to revolve out matter, substantially in the manner and for the object specified.

Tenth, The revolving or oscillating motion of the cylinder or chamber, the feeding end of which moves in the pulverized matter to be supplied to it for agitating and drawing the said pulverized substance into and through the said cylinder or chamber, in a continuous and equable stream, in the manner and for the purpose mentioned.

Eleventh, The widening and projecting outwardly of the feeding end of the rotating or oscillating chamber by means of arms or their equivalents, to describe a larger circle than the said cylinder or chamber in its revolution or oscillation in the pulverized ore contained in the hopper to stir up and throw into the said cylinder or chamber the said pulverized auriferous or argentiferous substance, substantially in the manner described.

Twelfth, The combination of the receiving eluriating pan with the discharging cylinder or chamber or its equivalent, whether moving or stationary, when the said cylinder or chamber, either revolving or stationary, is discharging into said pan gold or silver bearing quartz or ore in a pulverized state, which has been treated or amalgamated with the distilled vapor of quicksilver, and when at the same time the pan is supplied with the grinding and mashing drags, K, or any equivalent crushing device by which apparatus the said pan becomes substantially an arastra, and shown substantially in Fig. 1, in combination with any auriferous or argentiferous pulverized ore discharged from an amalgamator, in which it has been amalgamated with the distilled vapor of quicksilver to grind and mash and work over the said mass and separate from it the fine dewy particles of quicksilver condensed through it, and collect them into a liquid state to be used over again, all substantially in the manner and for the purposes hereinbefore set forth.

Thirteenth, The use of the drags, K, to grind the amalgamated mass and work out of it the fine particles of quicksilver, disseminated through it when the said fine particles result from the condensation of the distilled vapor of that metal.

Fourteenth, The use of the shaft and cog wheels, or any equivalent device by which the rotating shaft when attached by a belt or its equivalent to the driving power, shall move both the rotating cylinder or chamber and the drags, K, or their equivalent, substantially in the manner and for the purposes specified.

Fifteenth, The use of a rotating or oscillating conveyor for turning over and exposing the ore to the vaporized quicksilver during its passage through it, substantially as above set forth.

Sixteenth, Connecting the discharging end of the conveyor, L, at or near the bottom of the arastra so that the water may reach up therein and around it in the jacket pipe, J, and act on the descending vapor of the quicksilver as a condensor in the revolving or oscillating conveyor, substantially as and for the purpose above described.

Seventeenth, Making the joint which connects the conveyor with the arastra, and sustaining the lower end of the conveyor by means of a pipe, J, extending from the arastra, which permits the rotation of the conveyor in water and prevents the escape of the vapor of quicksilver from its lower end, substantially as described.

45,215.—Cigar-holder.—Louis Auguste, New York City:

I claim the application to a smoking tube, A, of a tubular socket, f, with perforated partition, g, and cap, h, and applied to the mouth piece, e, the whole constructed and arranged substantially as herein set forth.

[This invention consists in the employment of a removable sponge holder arranged in the interior of the cigar-holder and provided with a perforated partition and cup, in such a manner that said sponge holder will not obstruct the draught, and that it can be readily detached from the cigar-holder, and the sponge can be removed and cleaned without disturbing the other parts of the cigar-holder, and by these means a sponge saturated with camphor or other suitable material can be kept in contact with the smoke and any desired flavor can be given to the same.]

45,216.—Grubbing Machine.—Cortland Ball, Augusta, Mich.:

I claim the combination of the axle, A, wheels, B B, nuts, a a b b, toothed rings, c c, lever, D, suspended pawl, E, side braces, G G, the eye bolts, F F (on the peripheries of the wheels, B B), and the chain, H, all constructed, arranged and connected as herein shown and described.

[This is one of the most powerful and quickly operated machines for the purpose that we have seen. If any body wants a first rate grubbing or root-raising machine, we advise them to address the inventor of the above.]

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45,217.—Refrigerator.—George A. Banta, New York City. Ante-dated Nov. 16, 1864:

I claim, first, The arrangement of the side chambers, h and n, and back chamber, m, with the openings, 4, 7 and 5, as set forth, whereby the air, after passing over the ice, descends through the chambers, h, rises through the refrigerator, thence passes to the back chamber, m, and from that through the back chambers, n, and exit openings, 5, as specified.

Second, I claim the division, k, formed of slate with air chambers between the wooden case and slate divisions so that said slate has a circulation of air on both sides, as and for the purposes specified.

45,218.—Device for making Curvatures in Flexible Tubes.—Alexander Beckers, New York City:

I claim a helical curvature to surround the flexible pipe at the angle or bend, for the purposes and as specified.

I also claim a connection extending from one end to the other of said helical curvature, to retain the same at any desired distance apart, and preserve the bend or angle in the pipe, as set forth.

45,219.—Tobacco cutter.—Abijah E. and Josiah B. Blood, Lynn, N. Y.:

We claim, first, The arrangement and combination of the slotted knife-bar, D D, the lever, E, the guide-pin, d, and the side frames or cheeks, A B, all constructed and operating substantially in the manner and for the purpose specified.

Second, So arranging the gage-plate, h h, and its set screw, j, with reference to the upright part of the frame, A B, that said screws shall stand so far forward of the opening under the knife that it can not interfere with the material placed under the knife to be cut or divided, as herein set forth.

45,220.—Air-pump.—N. H. Borgfeldt, New York City:

I claim, first, A centrifugal air-pump, the working or pumping part of which acts under water or other liquid.

Second, The disk, A, revolving under water or other liquid and provided with a central supply pipe, b, and one or more radial discharge channels, d, in combination with the spring valves, e, and wings, C, constructed and operating substantially as and for the purpose set forth.

Third, The application of a cam groove, g, in combination with the wing or wings, C and revolving disk, A, constructed and operating substantially as and for the purpose specified.

[This invention consists in an air-pump provided with one or more movable parts, which, when moving in one direction, work against the pressure of the air previously compressed by the action of the pump, and at the same time create a vacuum to be occupied by the external air, and which, when moving in the opposite direction, are partially or wholly propelled by the action of the air previously compressed, and the expulsion of the fresh air, which entered to fill the vacuum, is facilitated.]

45,221.—Insulator for Telegraph Wires.—David Brooks, Philadelphia, Pa.:

I claim, first, The use in the manner described of a hollow cylinder, h, of paper or its equivalent in connecting the glass block, B, to the casing, A, by means of sulphur.

Second, Coating the interior of the space above the glass block as well as the edge of the casing, and of the sulphur near the same, also the stem of the wire holder with paraffine, in the manner and for the purpose described.

45,222.—Quartz-crusher.—Andrew Buchanan, Brooklyn, N. Y. Ante-dated Nov. 26, 1864:

I claim, first, As an improvement in quartz-crushing machines the crushing wheels, A A', provided with cogs, a a', and intervening cavities, b b', and arranged in relation to each other like cog wheels, substantially as and for the purpose herein shown and described.

Second, The application of the side flanges, D D', to the crushing wheels, A A', substantially as and for the purpose set forth.

45,223.—Car Sash Fastening.—W. H. Burridge, Cleveland, Ohio:

I claim the special construction and arrangement of the plate, B, with points, b, and projections, f, in combination with the cap, C, otches, c, and bolt, D, as a new and useful article of manufacture.

45,224.—Process for engraving Copper, etc.—A. F. Burson, Mt. Blanchard, Ohio:

I claim, first, As a new mode of producing an iodo-polished surface on a copper plate, as set forth, the polishing being done after the plate is iodized, modifies its chemical relations and produces a surface after it has been exposed to bromine, to light, and to the modified vapors of mercury, that resists the deposit of copper, whilst in the decomposition cell of an electrotyping apparatus, the plate after polishing containing a trace of iodine.

Second, I claim as my invention the modification of the vapors of mercury by the use of the sulphate of zinc or copper, or the sulphuret of antimony (the sulphate zinc is best), or their equivalents, by placing one or more in solution in mercurial bath, and then drying it, which modifies the mercurial vapors, causing it to be well defined on the lights of the image that has been produced on the plate by means of light.

Third, I also claim as my invention the method of iodizing polished copper plate once modifying the vapors of mercury, which when manipulated as described will produce a sharp and well defined picture (which I designate a photope), and on the lights of this image, produced in this manner, copper can, by means of electro-metallurgy, be deposited, whilst the coating on the shades, produced in manner set forth, will remain clear of the cupreous deposit (which I designate a photo-electrotype) thus giving elevation to lights and depression to shades; ink may be applied and prints obtained therefrom by means of a press, or the engraving may be used after applying silver or gold to alerate lights as a durable portrait, etc., or the image may be etched in, in place of depositing copper thereon in the usual manner. Let it here be understood that the copper coating to be a protection from the deposit of copper in electrotype cell, must be exposed to modified mercurial vapor, and have also been exposed to light and shade of an image.

Fourth, I claim in the foregoing to have made a new discovery of a principle—a discovery of an art, an art as broad in its relations to the family of arts as the daguerreotype itself—light and electricity producing a n image in solid metal as durable as bronze.

45,225.—Oscillating Valve.—J. W. Carhart, Cohoes, N Y.:

I claim a valve with a circular end, a, semi-circular end, b, and abutment, c, of such form as to effect a cut-off and fitted into a socket, B, to operate substantially as and for the purpose herein shown and described.

[This invention consists in the use of a plug or valve with one circular and one semi-circular end, the two ends being connected by a flat abutment in such a manner that when the plug is fitted into a corresponding socket, its circular end closes the socket all round, but its semi-circular end closes the socket only half ways, giving access to the steam to that compartment of the socket below the abutment and, by imparting to this plug an oscillating motion, the steam can be changed, throwing the parts alternately in communication with the steam pipe and with the exhaust pipe.]

45,226.—Machine for making Sheet Metal Pans.—Chas. F. Chambers, Hutsonville, Ill.:

I claim, first, In the described combination, the form, H, clamp, L, and the upsetting roller, E, guided and operated substantially as et forth.

Second, In the described combination with the clamps, 6 and 6', and the clamp, L l l M, or their equivalents, I claim the sectional or compound form, h, 1 2 3 4 5 1' 2' 3' 4' 5', substantially as set forth.

Third, The arrangement of self-retracting form, H, and regulating cam, K, substantially as set forth.

Fourth, The clamp, L l l', performing the double office of closing the blocks and holding down the work.

45,227.—Scraping Disk or Wad for Ordnance Cartridges.—J. M. Connel, Newark, Ohio:

I claim, first, The combination of the scraper as described, or its equivalent, with an india-rubber ordnance powder bag, applied within the same substantially as described.

Second, The construction of the scraper with an annular chamber e, and flanges, g, substantially as described.

45,228.—Harvester.—John Curtis, Hackettstown, N. J. Ante-dated Nov. 21, 1864:

I claim the reclining platform, A*, with endless carrying bands, C, in combination with the curved guide bars, D and hinged rake, E, constructed and operating in the manner and for the purpose substantially as herein shown and described.

[This invention consists in the application to the platform of a reaper—of a reclining frame furnished with two or more endless carrying bands stretched over suitable rollers or pulleys, in combination with curved guide bars and with an adjustable rake in such a manner that the grain on being cut is delivered in an upright or slightly reclining position to the carrying bands, and thence passed on to the curved guide bars which deposit the same in a swath on the ground in a position parallel with the rake head, or transversely to the direction in which the machine moves, and that by the action of the rake the grain can be readily gathered in heaps or bundles suitable for sheaves.]

45,229.—Flasks for Drain Pipes.—Edwin Dayton, Meriden, Conn.:

I claim, first, A case constructed substantially as described so that the parts may be united in any position in which they may be set together, for the purposes specified.

Second, The rings forming the two ends of the case in combination with the body of the case, when constructed so as to protect the edges of the case, substantially as described.

Third, The combination of a case and base when constructed so that the case may be longer than the pipe to be formed therein, substantially as and for the purpose specified.

Fourth, The herein described core, constructed substantially as and for the purpose specified.

Fifth, The pit described in combination with core case and base forming a flask, for the manufacture of pipe, substantially as and for the purposes specified.

45,230.—Changing Rotary into Reciprocating Motion.—Alexander Dean, Penn Yan, N. Y. Ante-dated Nov. 25, 1864:

I claim the drum, C, provided with the rims, d d d, and the cam rings, f f, having cams, g g, of varying eccentricity, fitting thereon, in combination with the reciprocating gate, D, provided with standards or bearings, K K, adjusting laterally to correspond with the position of the cams, in such a manner that a long or short stroke of said gate may be produced, substantially as herein set forth.

45,231.—Cultivator Plow.—John Doak, Keithburg, Ill.:

I claim connecting together the beams, G M, by means of flexible connections or hinges, G', for the purpose of allowing the beams, M, to receive a lateral movement from the stirrups, c, independently of the beams, G, while both the beams G M, may be moved vertically, simultaneously, by means of the arm, S, substantially as set forth.

45,232.—Hand Seed-sower.—George C. Fauckboner, Schoolcraft, Mich.:

I claim the cord, B, pulleys, C, and lever, F, in combination with gage pins, H H and E, and hopper or box, A, substantially as and for the purpose set forth.

45,233.—Tobacco Pipe.—Abijah Fessenden, East Boston, Mass.:

I claim dividing the bowl of the pipe into three or more concentric chambers) connected and arranged together, substantially as herein described and for the purposes specified.

45,234.—Animal Trap.—J. M. Flautt, Reedsburgh, Wis.:

I claim, first, The latch, f, arranged in combination with the tappet, g, on the edge of the trap door, and with the lever, h, chain or cord, i, spring catch, j and gate, D, and trap door, C, constructed and operating substantially as and for the purpose herein shown and described.

Second, I claim in combination with the above the weighted line, d, wheel, c, and escapement, b, by which, when the door is freed, it is caused to be again elevated substantially as described.

[This invention consists in arranging in the passage leading from the trap to the cage and connected with the trap door a hinged gate, in such a manner that the animal in passing from the trap to the cage locks itself in and at the same time resets the trap.]

45,235.—Riding Saddle.—J. M. Flautt, Reedsburgh, Wis.:

I claim the application to an ordinary saddle of a pommel which is composed of two distinct parts and connected to the saddle tree, substantially in the manner herein specified, so that the saddle can be readily changed from an ordinary to a side saddle.

[This invention consists in the application to an ordinary saddle of a pommel, which is composed of two distinct parts and connected to the saddle tree in such a manner that the saddle can be readily changed from an ordinary to a side saddle, and that one and the same saddle serves the double purpose of an ordinary and of a side saddle.]

45,236.—Sewing Machine.—John G. Folsom, Winchendon, Mass.:

I claim, first, Adjusting the looper or lower needle of a sewing machine to suit the different sizes of needles, by an endwise motion of its shaft, whether it be a vibrating or revolving looper, substantially in the manner and for the purpose above described.

Second, Locking the looper in its proper position, by sinking its eye and shank in the end of its shaft, substantially as above described.

[This invention consists in a novel method of adjusting the upper and lower needles to each other, and also in a new method of securing the lower needle to its shaft.]

45,237.—Safety Ship and Car-heating Stove.—George F. Foote, Cincinnati, Ohio:

I claim, first, A safety car and ship-heating stove made of wrought or sheet iron arranged with a horizontal plate, A, or perforated plate or grating B, when the above is combined with the draft openings, K, substantially as and for the purposes set forth.

Second, In combination with a stove constructed and arranged as specified in the foregoing clause, I claim the safety door fastening, F, as described.

45,238.—Machine for separating Hooks and Eyes.—Maltby Fowler, Northford, Conn.:

I claim the combination as above described, in a machine for separating hooks and eyes, and similar metallic articles, consisting of a hopper, C, a cylinder, B, with beaters, a, rotating in a case, A, with a discharging hopper and a box containing water in which the articles are received.

[This invention relates to a new and improved machine for separating hooks and eyes and other articles after being plated, in order to prevent the articles being soldered together by the plating as the latter cools.]

45,239.—Lighting Gas by Electricity.—Samuel Gardiner, Jr., New York City:

I claim dividing the current of electricity, generated by a galvanic battery, into several circuits, as herein specified, for the purpose of lighting a large number of gas burners by electricity.

45,240.—Lighting Gas by Electricity.—Samuel Gardiner, Jr., New York City:

I claim, first, The turning on and off illuminating gas, generating and discharging the electricity through a series of gas burners to be lighted by means of an ordinary bell crank, arranged as specified.

Second, I claim one or more disks, e, arranged and employed substantially as described, in an apparatus for lighting gas by electricity.

Third, I claim the arrangement of the receiver of the electricity, or its equivalent, as specified.

Fourth, I claim discharging the electricity from the receiver by the combined action of the star wheel, F, pin, u, lever, G, and adjusting spring, t.

Fifth, I claim the combination of the receiver, A, stop-cock, B, disks, e, forks, i, and discharging apparatus, F G n m, arranged and operating substantially as herein set forth.

45,241.—Lighting Gas by Electricity.—Samuel Gardiner, Jr., of New York City:

I claim broadly a tip of lava or other non-conducting material in the described combination, with an apparatus for lighting gas by electricity.

45,242.—Crutches.—Y. E. Gordon, of Cleveland, Ohio:

I claim, first, The arrangement of the springs, S S, ferrules, G G, in combination with the head, C, and sectional side rods, A A and B B, as and for the purpose set forth.

Second, I claim the springs, F F, ferrules, D D, and washers, d d, in combination with the hand piece, E, and sectional side rods, A A and B B, as and for the purpose described.

Third, I claim the springs, n n, catches, m m, in combination with the cross piece, H, rod, H', and sections, B B, as and for the purpose set forth.

45,243.—Artificial Grindstone.—George G. Griswold, of Chester, Conn.:

I claim combining sand with hydraulic cement, to form a substitute for the common grindstone, when the same shall be combined substantially as herein described.

45,244.—Warming and Ventilating Churches and Public Halls.—Edwin J. Hardy, of Buffalo, N. Y.:

I claim making the floors of church buildings and other public halls with open joints or perforations, which open joints or perforations are provided with movable stops, D, for regulating the passage of the air through the openings, in connection with a basement or lower room, having suitable stoves or furnaces for producing the requisite amount of heat, so that the heat from this lower room may be conducted directly through the floor into the pews or slips, substantially as described.

45,245.—Elevators.—N. D. Hinman, of Pleasant Vale, Conn.:

I claim the bars, J J L L, pivoted in the car, A, as shown, and the bars, J J, connected at one end by a cross piece, K, in combination with the button, G, on the chain, F and the pin, e, on the inclined ways, M, all arranged substantially as and for the purpose herein set forth.

I further claim the bent pawl, H, with the sliding rod, O, or its equivalent, with or without the spring, Q, arranged to operate in connection with the chain, F, and pulley, D, substantially as and for the purpose herein set forth.

[This invention relates to a new and useful improvement in that class of elevators which are connected with a car placed on elevated ways, and arranged in such a manner that the load, when elevated, may be drawn over the spot where it is desired to have it deposited, and then dumped. The invention is chiefly designed for elevating and mowing hay and grain in barns, but it is applicable to other purposes.]

45,246.—Mowing Machines.—M. G. Hubbard, of Syracuse, N. Y.:

I claim the combination and arrangement of the ratchetring and dogs in the driving wheel of a mowing machine, substantially as and for the purpose set forth.

45,247.—Steam-pressure Gages.—John Vivian Jepson, of New York City. Patented in Canada Nov. 5, 1863:

I claim, the combination in a pressure gage of the piston, flexible diaphragm, spring, index and dial, substantially as set forth.

I also claim the combination of the piston and spring with the toothed sector, pinion and index, through the intervention of a slide, substantially as set forth.

45,248.—Self-acting Pulley Brake.—John Jochum, of Brooklyn, N. Y.:

I claim as a new article of manufacture a nautical self-acting brake-pulley, to be suspended by a rope, B, and consisting of the body, A, shaft, C, sheave, D, ball, E, and spring, F, all constructed, arranged and operating as and for the purposes herein specified.

45,249.—Earth Pulverizer.—John Johnson, of Mount Washington, Ohio:

I claim in the construction of the implement herein described the combination and arrangement of the frame, A, pulverizer, C, furnished with open teeth, b, curved in the manner described, traction wheels, B, gearing, c d e f, and adjustable castor wheel, D, substantially as and for the purposes herein specified.

45,250.—Trusses for Inguinal Hernia.—S. & W. H. Jordan, of Roxbury, Mass.:

We claim as our invention the improved inguinal truss, consisting of the extra part or brace, B, the pad, A, the body belt, C, and the two brace straps, E F, arranged and combined together, substantially in the manner as hereinbefore specified.

45,251.—Fire-alarm Telegraphs.—Charles Kirchhof, of Newark, N. J.:

First, I claim the combination with a magneto machine of the automatic operating mechanism, to take the place of an operator, and so constructed as to convey any required number of signals at uniform or varying intervals, without any other manipulation than properly setting the indexes before starting the machine.

Second, I claim the traveler, l, constructed and operating substantially as described.

Third, I claim regulating the number of signals or impulses, by means of the sliding rod, D, and plate, t", operated by the attendant, substantially as specified.

Fourth, I claim the oscillating wheel, A, when constructed and operating substantially as and for the purpose set forth.

Fifth, I claim the key, f, provided with the spring, e3 when constructed and operating in the manner and for the purposes set forth.

Sixth, I claim the key, f, constructed as described, in combination with the cam, e2, operating in the manner and for the purposes set forth.

Seventh, I claim so constructing and arranging the automatic operators, A and l, that they can be thrown in and out of connection with the actuating mechanism at pleasure.

45,252.—Converting Motion.—A. E. Kline, of Goodville, Pa. Ante-dated Dec. 20, 1863:

I claim the combination of the elliptical groove, D, and roller, E, with the cross grooves, b c, and disc, A, in the manner and for the purpose herein shown and described.

45,253.—Apparatus for Pasting Photographs on Cards.—Charles S. Lucas, of Poughkeepsie, N. Y.:

I claim, first, The combination and arrangement of the platten, F, handle, W, spring, I, fingers or dog, G, and stop piece, H, or their equivalent, for the purpose heretofore set forth and described.

Second, The combination and arrangement of the paste box, K, frame, L, roller, M, and springs, N, or their equivalent, for the purpose heretofore set forth and described.

Third, The combination and arrangements of the movable bed, O, fingers or dogs, P, stop pieces, Q and X, or their equivalents, for the purposes heretofore described and set forth.

Fourth, The slide joint, Z, for connecting the bed, O, and slide, E, for the purpose heretofore set forth and described.

45,254.—Car Replacer.—John Mabie, of New York City:

I claim the blocks, A A, provided with flanges, E F, and with hooked lips, C, and either with or without the plates, B, all arranged substantially for the purpose herein set forth.

[This invention relates to a new and improved apparatus or device for placing railroad cars on the track in case of the former running off from the latter while traveling. The object of this invention is to obtain a simple and economical device for the purpose, which may be carried on the tender of the locomotive, so as to be always ready when required for use, and which may be very readily applied to the rails.]

45,255.—Sugar Mold Carriage.—Alexander Mackey, of New York City:

I claim, first, The construction of the adjustable upper portion of the carriage of a system of separate pivoted bars, H H, arranged to operate substantially as and for the purpose herein specified.

Second, The standard, J, applied in combination with the upright spindle of the caster or guide wheel, and with the bottom frame, A and standard, F, substantially as and for the purpose herein specified.

45,256.—Cooking Stove.—A. S. Markham, of Bushnell, Ill.:

I claim, first, The wood grate, J, and its rod, g, in combination with the tube, b, lever, C, and slotted foot, c, constructed and operated substantially as and for the purpose above described.

Second, I also claim the coal grate, with its journals, p, bent down as described in combination with the tubes, i, the troughs, t, and

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the sliding rods, a, connecting rod, b, and lever, C, substantially as and for the purpose above described.

[This invention consists in so constructing grates for cooking and other stoves as to enable one to raise and lower them at pleasure. The devices employed make the principle applicable to both coal and wood grates, and the dumping of the rate is provided for when the coal grate is used.]

45,257.—Seed Planters.—James M. Maxwell, of Cape Elizabeth, Maine. Ante-dated Dec. 13, 1862.

I claim the combination as well as the arrangement of the seed-dropping apparatus, and its furrow-opener and closers, with the plow and the wheel arranged in the heel of the latter.

I also claim the combination of the gate, D, and its operative mechanism, viz., the lever, E, and latch, m, with the seed-dropping apparatus and the plow.

I also claim the combination of the wheels, s s' and their operative mechanism, viz., the arms, t u, bar, v, and lever, w, with the plow and the third wheel, B, arranged within or at the heel of the plow, as specified.

I also claim the improvement by which the furrow-opener and its closers are enabled to pass a stone or obstacle, the same consisting in the flexible conductor and the yielding supporting arm, the same being applied to the hopper and the plow, in manner and so as to operate substantially as specified.

45,258.—Pocket Pipe Cleaner.—Gustavus E. Matile, of Washington, D. C.:

I claim the arrangement of the various parts of a pocket pipe cleaner in the manner and for the purpose specified, substantially as described.

45,259.—Machine for Scutching Tangled Flax.—William C. McBride, of Raritan, N. J.:

First, I claim attaching the scutching blade arms, G, to the disk or head, C, by means of bolts, d, provided with springs, e, arranged as shown, or in any equivalent way, to admit of the yielding of the scutching blades, substantially as and for the purpose herein set forth.

Second, The feeding of the flax to the scutching blades by means of the roller, J, and concave, I, arranged in the manner substantially as herein described.

Third, The adjusting of the scutching blades, H, nearer to or farther from the edge of the concave, I, by means of the shaft, B, having the collar, E, and screw, F, adjustable upon it, as set forth.

Fourth, The screen or riddle, W, when used in connection with the rotary scutching blades, feed roller and concave, substantially as set forth.

45,260.—Apparatus for Reversing the Motion of Rolls.—Geo. F. McCleane, of Pittsburgh, Pa.:

I claim the special arrangement and combination of the mechanism hereinbefore described, for reversing the motion of rolls, consisting of two shafts, a and b, placed in the same axial line, one of which is connected with the rolls, and each carrying a miter wheel, which wheels, f and h, both gear into a miter wheel, g, placed at right angles to and between them, one of the miter wheels, f, being attached to its shaft, a, and the other, h, to a loose sleeve, e, on the shaft, b, with a crab, k, placed on one of the shafts, b, with which it revolves, between the miter wheels, so that by sliding the crab to one side or the other the roll shaft, b, is geared either directly with the driving shaft, a, which moves in one direction, or with the miter wheel, h, and loose sleeve, e, which move in the opposite direction, substantially as described.

45,261.—Fibrous Packing for Steam Engines.—Wm. Hartley Miller, of Philadelphia, Pa. Ante-dated April 3, 1863 :

I claim the application to the packing yarn of a substance which will make it more efficient, using for that purpose the aforesaid chemical compound, or any other substantially the same, and which will produce the intended effect.

Second, I claim the application to the packing yarn of a cloth or canvas, or other fibrous covering, prepared as herein described, or any other substantially the same, and which will produce the intended effect.

Third, I claim the application of either of the above separately, and without reference to each other, as herein described, and any other substantially the same and which will produce the intended effect.

45,262.—Breech-loading Fire-arms.—William Morganstern, of Philadelphia, Pa.:

First, I claim a breech-piece, arranged to slide to and from the open end of the barrel of a firearm, in combination with the slotted arm, J, or its equivalent, and an inclined lever, E, the whole being so constructed and arranged, and so connected with the hammer that the latter shall be cocked by and during one movement of the breech from, and one movement to the rear of, the barrel.

Second, A slot or recess, u, so formed in the breech, and so arranged in relation to the recessed projection, 4, that a portion of the head of the metallic cartridge shall be accessible to a hammer hung beneath the breech.

Third, A hammer, F, with a pin or pins, k, or their equivalents, the spring, G, or their appropriate spring, the lever, E, the pin, I, and trigger, H, or other analogous devices for retaining and releasing the said lever, the whole being arranged on a firearm, and operating substantially as set forth.

Fourth, The pendant arm, J, so connected to the sliding breech, or to the pin, L, that it can move longitudinally, but not turn laterally, with the said breech, in combination with the inclined arm of the lever, E.

Fifth, The arm, K, attached to or forming a part of, and arranged to move laterally and longitudinally with the sliding breech, in combination with the lever, E, when the latter, and the said arm, K, are so constructed and so arranged in respect to each other that the said lever, F, is held stationary until the said breech is locked to the frame.

Sixth, The pin, I, arranged to slide in the projections, n and n', of the frame, D, the spring, p, and trigger, H, the whole being constructed and arranged in respect to the lever, E, and operating substantially as set forth, for the purpose specified.

Seventh, The lever, P, and bar, 15, or their equivalents, arranged in respect to the lever, E, and operating substantially as and for the purpose set forth.

45,263.—Eye Protectors.—Lewis Morse, of North Attleboro, Mass.:

I therefore claim the improved manufacture of eye protector, as made with its base frame, and eyes stamped and grooved or channeled from a single plate of metal and applied to the wire gage cover, in manner substantially as described.

45,264.—Cultivators.—James D. Osborn, of Goshen, Ind.:

First, I claim the two-part axle, E E', as employed in combination with the levers, G G', racks, F F2, and wheels, D D', the whole being constructed and arranged in the manner and for the purpose specified.

Second, I claim the tongue, K, in combination with the beam, B, roller, I', arm, I, rod, H, lever, G, and castor wheel, L, all arranged and operating in the manner described, to convert the implement from a stiff to a loose-tongued machine.

Third, In combination with a cultivator, constructed as herein described, I claim the slide, Q, arranged and employed substantially as and for the purpose specified.

45,265.—Carriage Springs.—R. W. Parker, of Woburn, Mass.:

I claim the springs, C C, constructed with lowered ends, and parallel, or nearly parallel sides, attached at their ends to the front and rear bolsters of a carriage, and supporting the seat or body upon their sides between said bolsters, all substantially as herein shown and described.

[This invention consists in having two springs constructed, either of metal or wood, and bent or curved in bow shape, with parallel, or nearly parallel sides, said springs being attached to the front and back bolsters of the vehicle with their sides, underneath the sides of the body of the latter, the body resting on the sides of the springs, and all so arranged whereby it is believed that several advantages are obtained over the ordinary springs in present use.]

45,266.—Medicine Chest.—R. B. Parkinson and J. M Marvis, of Philadelphia, Pa.:

We claim, first, A medicine chest, composed of the exterior case or cover, A, of leather or other like material, and the interior box, C, with spaces arranged between the two, substantially as and for the purpose herein set forth.

Second, The combination of the said case with the pouches, B B, at the end of the same, for the purpose specified.

45,267.—Horse Collars.—George F. Parsons, of Baltimore, Md.:

I claim the improved article of manufacture, the collar for horses, mules, etc., constructed of leather alone, of leather and the other materials of fabrics named, or of any suitable material, the different layers of the leather or other material being secured to each other by metallic rivets, as herein recited.

45,268.—Machine for Making Nuts.—James Paton, of Newburg, Ohio :

First, I claim the above-described machine, when arranged, constructed and operated substantially as set forth.

Second, I claim the cross bar, L, and springs, L', in combination with the die, K, substantially in the manner and for the purposes specified.

Third, I claim the lever, Q, sliding frame, C, arm, R', and cam, e, in combination with the punch, M, dies, K and D4, and matrix, when arranged and operating conjointly, substantially as and for the purpose set forth.

45,269.—Machine for Making Bolts and Rivets.—J. Paton, T. Campbell, and R. Paton, of Newburg, Ohio :

We claim, rst, The above-described machine, when constructed, arranged and operated, substantially as set forth.

Second, We claim the use of the hooks, p p, in combination with the vibrating jaw, E, and cam, G, substantially as and for the purpose set forth.

Third, We claim the special arrangement of the reciprocating head, H, arms, H' H', followers, K, in combination with the plunger, J, vibrating lever, K', and cams, I I', when constructed operated conjointly, substantially as and for the purpose set forth.

45,270.—Fifes.—John Pfaff, of Philadelphia, Pa.:

I claim the ridges, b, arranged in respect to the mouth opening, a, of a fife or other like instrument, as and for the purpose specified.

45,271.—Washing Machine.—Wm. Pollyblank, of Cleveland, Ohio :

I claim the special arrangement of the weighted corrugated balls, in combination with the rotating corrugated cylinder, B, circular frames, h, and tub, A, when operating conjointly as and for the purpose set forth.

45,272.—Wash Kettle.—John Reist. of Philadelphia, Pa.:

I claim the described improvement in wash kettles, consisting in the application thereto of a false bottom, B, upright tube, D, and revolving cap piece, E, the whole operating substantially in the manner and for the purpose specified.

45,273.—Wind Wheels.—George H. Reister, of Washington, Iowa :

I claim, first, Operating the movable guides by the vane, u, and the other means or devices as herein recited, the several parts being arranged in relation to each other substantially as described.

Second, I claim in combination with the guides the adjustable shutters for concentrating and directing the wind to the inlets, as set forth.

45,274.—Frames for Saws.—Thomas D. Roberts, of Middletown, N. Y.:

I claim the combination of the frame, A B, consisting of two pieces connected by a pin, at a, the cross bar, E, the saw blade, C, and the screw bolt, b, attached to the end of the saw blade, and receiving a thumb nut, D, bearing upon the handle, A, all as herein shown and described.

[This invention relates to an improvement in that class of handsaws in which the saw blade is strained in a wooden frame, and it consists in constructing the frame of the pieces of wood with a central bar, the saw blade being secured in the two main parts of the frame, and all so arranged that the frame may be constructed at much less cost than the ordinary frames, and also be more durable.]

45,275.—Print for Bituminous Roofing Fabrics.—Alfred Robinson, of New York City:

I claim a bituminous roofing fabric, having its surface made of any suitable color, substantially as herein described.

45,276.—Brush Handle.—Fred. Rudolph and Wm. Kasefang, of Jersey City, N. J.:

I claim a hoop or loop, C, projecting from a shank, B, in combination with the hinged jaws, E E, and handle, A, constructed and operating substantially as and for the purpose set forth.

45,277.—Churns.—Henry Soggs, of Columbus, Pa.:

I claim the suspended dashers, D E, hinged to the rigid cross beam, F, in combination with the swinging pyramidal tub, B, for the purposes and substantially as described.

45,278.—Sewing Machine.—Greenleaf Stackpole, Ellsworth, Maine. Ante-dated Sept. 17, 1863 :

I claim the combination of a sewing machine for making in cloth or other material, with two threads, one straight row of stitches or line of sewing with auxiliary machinery for simultaneously making with other two threads another and parallel separate and distinct straight row of stitches of sewing in the said cloth or material, the whole being substantially as above described.

I also claim the combination or its equivalent of the said auxiliary sewing machinery with the said sewing machine in such manner and by such means as to enable the two shuttles and two needles and their accompanying parts to be simultaneously adjusted relatively to one another so as to cause them to make the two lines of sewing either nearer to or further apart from one another, as circumstances may require, the whole being substantially as described.

I also claim the combination and the fastening of one end of the cloth bridge and needle guide, 13, to the main machine, or to the plateform, e2, of the auxiliary machinery, leaving the unfastened end free; so that the unfastened end will move easily in the main machine or the platform, e2, moves easily under the bridge when one end of the bridge is fastened to the main machine, substantially as above described.

I claim the running of two shuttles simultaneously in separate race ways, face to face and parallel to each other, which are adjustable any distance apart, in conjunction with the needles, substantially as herein described.

I claim the simultaneous running of two separate distinct parallel curved lines of sewing any distance apart, disconnected from each other when using to form the same, two shuttles running face to face.

45,279.—Carriage Axle Box.—Wm. Stechschult, Glandorf, Ottawa Postoffice, Ohio :

I claim an axle box, A, cast solid throughout enclosing the projections of the linch-pins and the end of the spindle and applied in combination with the screw plug, d, annular groove, e, and linch-pins, f f, constructed and operating in the manner and for the purpose herein shown and described.

[This invention consists in an axle box which is cast solid with the cap which closes the same in front and which is perforated with a small oil hole that is closed when not used by a screw plug, in such a manner that the oil poured in the axle box is scraped off and pushed back therein by the action of the spreading noses, and no oil is allowed to waste, and furthermore a solid, cheap, and durable axle box is produced.]

45,280.—Churn.—Alexander Stevens, Washington, Iowa :

I claim the combination and arrangement of the wheels, pulleys and upright cylinders, the same being constructed and operated as herein set forth.

45,281.—Street Railway Car.—John Stephenson, New York City :

I claim, first, The employment or use of the iron or other metal abutments, B, applied to the car and constructed in such a manner that the ends of the truss rods may pass through them and be firmly secured therein, substantially as set forth.

Second, The passing of the truss rods, C, through the sills, a, of the car below their undersides, substantially as described.

Third, The combination of the truss rods with the abutments and studs, all arranged and applied as and for the purpose set forth.

45,282.—Corn Harvester.—Thomas H. Storms & John C. Poffenberger, Jacksonville, Ill.:

We claim, first, The adjustable or pivoted semi-circular bars, Q Q, in connection with the jaws, S S, and annular frame, P, all constructed as shown to operate, substantially in the manner and for the purpose set forth.

Second, The windlass, N, when used in combination with the annular frame, P, and its attached parts, substantially as and for the purpose specified.

Third, The sliding and adjustable platforms, I I, arranged in connection with the bars, H H K, so as to admit of holding the stalks until they are grasped by the jaws, s s, and then admit of being shoved back, and turned upward to allow of the shock being discharged, as described.

Fourth, The rest, V, in combination with the reel, R, cutting device, D, movable or pivoted bars, Q Q, jaws, S S, annular frame, P, slides, O O, and windlass, N, arranged on a mounted frame, substantially as and for the purpose specified.

[This invention relates to a new and improved machine, whereby standing corn may be cut and left upon the field in shocks, the whole work being done at one operation and with one and the same machine.]

45,283.—Washing Machine.—Frederick C. Walker, New York City. Ante-dated Nov. 16, 1864 :

I claim constructing a washing machine with a series of corrugated slats alternating with each other, in combination with a semi-cylindrical rubber formed with a cavity, f, for the purposes and as specified.

45,284.—Constructing Bales of Hay.—Orson & Charles Waste, Cameron, Ill.:

We claim the constructing and arranging a bale of hay with sheets of hay which have been pressed or crushed and cut, in the manner described.

45,285.—Machine for Preparing Hay for pressing into Bales.—Orson & Charles Waste, Cameron. Ill.:

I claim the rollers, C C, and knives, D D, when constructed and arranged as and for the purpose specified.

45,286.—School Desk and Seat.—Theos. Weaver, Harrisburgh, Pa.:

I claim, first, The standards, A A, the foot rest, B, which penetrates them at various hights from the floor, the book-case, P P P, combined and arranged substantially as and for the purposes herein described.

Second, The combination and arrangement of the adjustable folding leaf, L M, the ledge, N, its slots, T T, the notched braces, C C, their axes, D D, operating substantially in the manner as and for the purposes herein set forth.

Third, The combination and arrangement of the adjustable rods, G and H, the diverted rod, F, the sliding back, E, the seat, K, the ratchets, I I, the automatic spring, O, supported by its coils around F, and its insertion into the back, E, operating substantially in the manner as and for the purposes herein shown and described.

45,287.—School Table and Seat.—Theos. Weaver, Harrisburgh, Pa.:

I claim, rst, The standards, R R, with their slots and rods, K K, at different hights, the burrs, L L L L, to clamp and unclamp them when adjusted, and the hat racks formed by the hooked extremities of the burrs, combined, arranged, and operated as herein shown and described.

Second, The combination and arrangement of the compound adjustable leaf, A C D, hinged together underneath the sections; section, D, hinged to the plank, F', the guide, J, the slides, M and N, the mode of inserting them into the plank, F', the staple, U, the adjustable ledge, B, with its slots, the button, E, operating substantially in the manner as and for the purpose herein set forth.

Third, The combination and arrangement of the haunch rod, W, the toggle joint, O, the curved arm, X, the slots, Q Q, in seat and back, the notched brace or rubber, A', the hinges, Z, substantially as and for the purposes herein set forth

Fourth, The combination of the adjustable ledge, B, with sections, D and A, for the purpose herein described.

45,288.—Car Coupling.—Edwin F. Wells, New York City :

I claim the drop pin, B, in combination with the segment slide, G, fitted in a curved opening, F, at the rear of the opening, D, which receives the link, E, all being arranged within the draw-head, A, and with a link or shackle, E, to operate in the manner substantially as and for the purpose herein set forth.

[This invention relates to a new and improved car coupling of that class which are commonly termed self-acting or self-coupling.]

45,289.—Amalgamator.—Zenas Wheeler, San Francisco, Cal.:

I claim the pan, O O, with a double bottom or diaphragm in combination with the stirrer, A A, and guides, E E, substantially as described.

45,290.—Revolving Fire-arm.—Rollin White, Lowell, Mass.:

I claim arranging the trigger in the frame in which the many chambered cylinder revolves, and in front of the chambers of the cylinder which happen to be below the fixed barrel as described, so that the hand in grasping the handle of the pistol and the lower part of the chambered cylinder will have the fore finger bearing conveniently against the trigger.

I claim the stationary rest or anvil on which the fulminate of the cartridges is fixed, in combination with the many chambered revolving cylinder.

45,291.—Horse Power.—Frank Wicks, Kansas, Ill.:

I claim in combination with a divided or sectional hub in a hoisting apparatus, a sweep or its equivalent on one of the sections, and a rope wheel or its equivalent on the other section, and a cam interposed, so that when the sweep rides up on the cam, the sections of the hub will be disconnected, and the rope allowed to run independent of the motion of the horse or team, substantially as described.

45,292.—Metallic Cartridge.—Wm. H. Wills, Boston, Mass.:

I claim covering the heel of the cartridge case, A, by a metallic screw-cap, B, substantially in the manner and for the purpose set forth.

45,293.—Tool for Cutting Rivets.—Peter Wixcel, Lafayette, Ill.:

I claim connecting the movable jaw, B, to the cam lever by means of the joint, e, or its equivalent, substantially as described.

[This invention consists in improvements upon the ordinary bolt cutter by which the power applied to the cutter is constantly increasing as the cutting proceeds, until the work is finished.]

45,294.—Cutter for Cutting Gear Wheels.—Joseph R. Brown (assignor to himself and Lucien Thorpe), Providence, R. I.:

I claim a cutter for cutting the teeth of gears composed of a series of cutting blades or teeth, constructed substantially as described.

45,295.—Railroad Frog.—E. M. Caulkins. Worcester, Mass., assignor to himself and John J. Powers, Grafton, Mass.:

I claim the combination of a cast-iron frog, A, with two spring rails, G, working independently of each other and forming a continuous rail on each side of the frog, when constructed and operated substantially as and for the purposes described.

45,296.—Corset Skirt Supporter.—Lavinia H. Foy (assignor to James H. Foy), Worcester, Mass.:

I claim, first, The combination of the straps, J J, body, A, and extensor or skirt supporter, M, or the equivalent thereof, substantially as described.

Second, The combination with the shoulder-straps, J J, body, A, and extensor or skirt supporter, M, of a laced opening, K, or the equivalent thereof, extending down the back, substantially as and for the purposes set forth.

45,297.—Tool Elevator for Lathes.—Wm. Hamilton (assignor to himself and Josiah B. Fuller), Chicopee, Mass.:

I claim, first, The combination of the pieces, A B and C, or their equivalents, when constructed and used substantially in the manner and for the purpose described

Second, The ratchet formed by the notches O O O' O', on the pieces, A and B, when used in combination with the pieces, B and C, substantially in the manner and for the purpose described.

45,298.—Fence.—H. B. Myers (assignor to himself, James A. Ostrom & H. Crawford), Schoolcraft, Mich.:

I claim the oblique kerfs, a, at or near the top end of the pickets, E, and the dowel pins, b, in their bottom ends to operate in combin-

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ation with the wire, D, and foundation rail, C, in the manner and for the purpose substantially as set forth.

Also the bends, C, in the wire, D, to operate in combination with the oblique kerfs, a, in the pickets, substantially as and for the purpose described.

[This invention consists in the employment or use of pickets provided with an oblique kerf at or near their top ends and with dowe pins or tenons projecting from their bottom ends to be used in combination with a wire stretched from one post to the other, and with a longitudinal foundation rail in such a manner that by causing the oblique kerfs to catch over the wire and inserting the dowel pins in appropriate sockets in the foundation rail, the pickets are steadied on top and bottom, and a light, durable, and cheap fence is produced.]

45,299.—Harness Snap.—Charles H. Palmer (assignor to George Edwards), Newark, N. J. Ante-dated Nov. 16, 1864 :

I claim the tongue constructed as described and the combination of the spring therewith, in the manner and for the purpose set forth.

45,300.—Bearing for Flyers of Spinning Machines.—Blaney E. Sampson, Boston, Mass., assignor to himself and George N. Towbridge, Rollinsford, N. H.:

I claim the application of the green hide collar or its equivalent to the flyer neck bearing, in the manner or by the mode substantially as hereinbefore specified.

I also claim the improved flyer neck bearing as made with the annular chamber, c, for reception of the raw hide collar, d, and with the opening or passage, e, leading laterally out of the said chamber, in manner as specified.

45,301.—Paper Envelope.—Richard Shepard, Brooklyn, N. Y., assignor to Fitch, Estee & Co., New York City :

I claim the strips, A A A and B, substantially as and for the purpose set forth.

45,302.—Rockers for Furniture.—Abraham Strawbridge (assignor to himself and Michael Sehman), Covington, Ky.:

I claim the combination of the dove-tailed grooves, B, rubber strips, C, bosses, D D, and screws, b b, all constructed, arranged and employed in the manner and for the purpose specified.

45,303.—Composition for Preventing Incrustation in Steam Boilers.—Alonzo Temple (assignor to himself and J. L. Fitch), Bridgeport, Conn.:

I claim the within-described composition for preventing or removing incrustation of steam boilers.

45,304.—Device for Packing Dry Goods Boxes.—Thomas Webber (assignor to himself and Volney Rusco), Chicago, Ill. Ante-dated Nov. 25, 1864 :

In combination with the foundation, A, and windlass, B, I claim the chains, h h, and claw-rods, i i, or their equivalents, arranged and operating substantially as and for the purpose set forth.

45,305.—Water Wheel.—James White, Cleveland, Ohio :

I claim, first, The combination of the stone with the hoop, b, supported by a rim, a, and the tram screws, c, for the purpose of adjusting the position of the bed stone with reference to the shaft, substantially as shown and described.

Second, I claim the arrangement of the levers, p, extending from the circular piece, p', the arms, n, rods, n', the gates, m', which when moved causes the openings through which the water passes to the wheel to be larger at the periphery than at the inner portion of said gates, whereby to use the water with economy, and regulate the power to suit the work to be done by the stones, as herein shown and described.

RE-ISSUES.

1.826.—Grain Separator.—Jonathan L. Booth, Rochester, N. Y. Patented Sept. 20, 1859. Re-issued Sept. 25, 1860 :

I claim the combination of the zig-zag screens and boxes, B C, when the same have a lateral shake motion or one at right angles to the passage of the grain in such a manner as to have the grain pass consecutively over and through them, and arranged relatively with each other to operate substantially as and for the purpose herein set forth.

I also claim the series of zig-zag screens and boxes, B C, with or without the troughs, E, and having a lateral shake motion in connection with the fan, G, and spout, H, substantially as herein set forth.

1,827.—Machine for Grinding and Amalgamating Gold and Silver.—W. H. Hepburn & G. K. Peterson, San Francisco, Cal. Patented April 19, 1864 :

We claim, first, The pan, B, with a concave bottom in combination with a corresponding shaped muller, in shell form having openings in the hub and shell sufficient to allow the pulp to pass freely to the grinding surfaces arranged with or without the ribs, m, substantially as described and for the purpose set forth.

Second, The arrangement of the shoes, P, provided with curved beveled edges and attached to the under side of the muller, H, so as to form oblique or spiral curved grooves, p, in reverse direction to relation of muller, for the purpose specified.

Third, The spiral flanges or ribs, m*, on the upper side of the muller, as described.

Fourth, The arrangement of the hand-wheels, O N, thimble, L, and tubular screen, M, substantially as described and for the use and purposes as herein before set forth.

1,828.—Shirt Collar.—Wm. E. Lockwood, Philadelphia, Pa., assignee by mesne assignments of Walter Hunt, New York City. Patented July 25, 1854 :

I claim a shirt collar composed of paper and muslin, or its equivalent, and polished or burnished, substantially as and for the purpose described.

1,829.—Machine for Making Horse-shoes.—Barney Mee, Troy, N. Y. Patented June 9, 1863 :

I claim combining with the rotating male mold around which the rod of iron is bent, the vibrating lever for pushing the rod when bent away from the front or toe end of the mold, and the sliding bar with its diagonal groove for operating the said vibrating lever, substantially as herein described.

1,830.—Manufacture of Sugar.—John Findley Riggs, Fremont, Nebraska Territory. Patented Jan. 26, 1864 :

I claim refining sorghum or other sugar by applying a liquid to dissolve the gum, and removing the same by pressure.

EXTENSIONS.

Sewing Machine.—Allen B. Wilson, Waterbury, Conn. Patented Nov. 12, 1850. Re-issued Jan. 22, 1856. Extended Nov. 12, 1864 :

I claim, first, The method of causing the cloth or material to be sewed in a sewing machine to progress regularly by the joint action of the surfaces between which it is clamped and which act in conjunction, substantially in the manner and for the purposes herein specified.

Second, I claim holding the cloth or other material at rest by the needle or its equivalent, in combination with the method of causing it to progress regularly, the whole substantially as herein set forth.

Third, I claim arranging feeding surfaces, substantially such as are herein specified, in such relation to the needle as herein set forth, that they or one of them shall perform the office of stripping the cloth or material from the needle as it rises or recedes from it, as herein described.

Fourth, I claim so mounting and attaching one of the feeding surfaces to some other part of the machine, that it may be removed or drawn away from the other surface at pleasure, substantially in the manner and to effect the objects herein set forth.

Sewing Machine.—Allen B. Wilson, Waterbury, Conn. Patented Nov. 12, 1850. Re-issued Dec. 9, 1856. Extended Nov. 12, 1864 :

I claim, first, The combination in a single machine of these three following elements, namely, a table or platform to support the material to be sewed, holding it for the action of the needle and presenting it properly to the grasp of the feeding apparatus; a sewing mechanism proper consisting of a needle and shuttle, or their equivalent, and a mechanical feed automatic, and causing the cloth to progress regularly, to which the cloth is not attached, and so grasping the cloth that it may be turned and twisted by the hand of an operator, such twisting not interfering with the regular progression of the cloth, and the whole being constructed and acting together and in combination with each other, substantially in the manner and for the purposes herein specified.

Second, I claim moving a shuttle so shaped and held by its race, that jaws may embrace it, by means of two jaws which are alternately in contact with the shuttle and are constructed and move substantially in the manner herein set forth, making and breaking their contact without any aid from cams or springs or the equivalent of such devices.

Third, I claim a double pointed shuttle, substantially such as is herein specified in combination with jaws for driving it, substantially such as are described whereby the shuttle may be thrown alternately from opposite directions through loops without practically disturbing the loop thread.

Valve for Governors.—Junius & Alfred Judson (assignor to Junius Judson), Rochester, N. Y. Patented Nov. 5, 1850. Re-issued Jan. 10, 1854. Extended Nov. 5, 1864 :

We claim making the opening or openings controlled by the governor valves of steam engines of gradually increasing capacity from the closed towards the open position, substantially in the manner and for the purpose specified.

And we also claim interposing a spring between the valve cover and the set screw or its equivalent, which determines or sets the position of the face of the valve to its seat, so that the tension of the said spring shall resist the pressure of the steam on the valve cover, and thereby produce an increased flow of steam to the cylinder, substantially as specified.

And we also claim the employment of the valve lever, adjustable to the steam of the valve, in combination with a fixed indicator, substantially as specified for the purpose of setting the valve in any required position without opening the valve box, as set forth.

PATENTS

GRANTED

FOR SEVENTEEN YEARS.

MUNN & COMPANY,

In connection with the publication of the SCIENTIFIC AMERICAN, have acted as Solicitors and Attorneys for procuring "Letters Patent" for *new inventions* in the United States and in all foreign countries during the past *seventeen years*. Statistics show that nearly ONE-THIRD of all the applications made for patents in the United States are solicited through this office; while nearly THREE-FOURTHS of all the patents taken in foreign countries are procured through the same source. It is almost needless to add that, after *seventeen years'* experience in preparing specifications and drawings for the United States Patent Office, the proprietors of the SCIENTIFIC AMERICAN are perfectly conversant with the preparation of applications in the best manner, and the transaction of all business before the Patent Office; but they take pleasure in presenting the annexed testimonials from the three last ex-Commissioners of Patents.

MESSRS. MUNN & CO.:—I take pleasure in stating that, while I held the office of Commissioner of Patents, MORE THAN ONE-FOURTH OF ALL THE BUSINESS OF THE OFFICE CAME THROUGH YOUR HANDS. I have no doubt that the public confidence thus indicated has been fully deserved, as I have always observed, in all your intercourse with the office, a marked degree of promptness, skill, and fidelity to the interests of your employers. Yours very truly

CHAS. MASON.

Judge Mason was succeeded by that eminent patriot and statesman, Hon. Joseph Holt, whose administration of the Patent Office was so distinguished that, upon the death of Gov. Brown, he was appointed to the office of Postmaster-General of the United States. Soon after entering upon his new duties, in March, 1859, he addressed to us the following very gratifying letter.

MESSRS. MUNN & CO.:—It affords me much pleasure to bear testimony to the able and efficient manner in which you discharged your duties as Solicitors of Patents, while I had the honor of holding the office of Commissioner. Your business was very large, and you sustained (and I doubt not justly deserved) the reputation of energy, marked ability, and uncompromising fidelity in performing your professional engagements.

Very respectfully, your obedient servant,

J. HOLT.

Hon. Wm. D. Bishop, late Member of Congress from Connecticut, succeeded Mr. Holt as Commissioner of Patents. Upon resigning the office he wrote to us as follows:

MESSRS. MUNN & CO.:—It gives me much pleasure to say that, during the time of my holding the office of Commissioner of Patents, a very large proportion of the business of inventors before the Patent Office was transacted through your agency; and that I have ever found you faithful and devoted to the interests of your clients, as well as eminently qualified to perform the duties of Patent Attorneys with skill and accuracy. Very respectfully, your obedient servant,

WM. D BISHOP.

THE EXAMINATION OF INVENTIONS.

Persons having conceived an idea which they think may be patentable, are advised to make a sketch or model of their invention, and submit it to us, with a full description, for advice. The points of novelty are carefully examined, and a written reply, corresponding with the facts, is promptly sent, free of charge. Address MUNN & CO., No. 37 Park Row, New York.

As an evidence of the confidence reposed in their Agency by inventors throughout the country, Messrs. MUNN & CO. would state that they have acted as agents for more than TWENTY THOUSAND inventors! In fact, the publishers of this paper have become identified with the whole brotherhood of inventors and patentees, at home and abroad. Thousands of inventors for whom they have taken out patents have addressed to them most flattering testimonials for the services rendered them; and the wealth which has inured to the individuals whose patents were secured through this office, and afterwards illustrated in the SCIENTIFIC AMERICAN, would amount to many millions of dollars! Messrs. MUNN & CO. would state that they never had a more efficient corps of Draughtsmen and Specification Writers than those employed at present in their extensive offices, and that they are prepared to attend to patent business of all kinds in the quickest time and on the most liberal terms.

PRELIMINARY EXAMINATIONS AT THE PATENT OFFICE.

The service which Messrs. MUNN & CO. render gratuitously upon examining an invention does not extend to a search at the Patent Office, to see if a like invention has been presented there; but is an opinion based upon what knowledge they may acquire of a similar invention from the records in their Home Office. But for a fee of $5, accompanied with a model, or drawing and description, they have a special search made at the United States Patent Office, and a report setting forth the prospects of obtaining a patent, &c., made up and mailed to the inventor, with a pamphlet, giving instructions for further proceedings. These preliminary examinations are made through the Branch Office of Messrs. MUNN & CO., corner of F and Seventh streets, Washington, by experienced and competent persons. Many thousands of such examinations have been made through this office, and it is a very wise course for every inventor to pursue. Address MUNN & CO., No 37 Park Row, New York.

HOW TO MAKE AN APPLICATION FOR A PATENT.

Every applicant for a patent must furnish a model of his invention if susceptible of one; or, if the invention is a chemical production, he must furnish samples of the ingredients of which his composition consists, for the Patent Office. These should be securely packed, the inventor's name marked on them, and sent, with the Government fees, by express. The express charge should be pre-paid. Small models from a distance can often be sent cheaper by mail. The safest way to remit money is by a draft on New York, payable to the order of Messrs. MUNN & CO. Persons who live in remote parts of the country can usually purchase drafts from their merchants on their New York correspondents; but, if not convenient to do so, there is but little risk in sending bank bills by mail, having the letter registered by the postmaster. Address MUNN & CO., No. 37 Park Row, New York.

Patents are now granted for SEVENTEEN years, and the Government fee required on filing an application for a patent is $15. Other changes in the fees are also made as follows :—

On filing each Caveat	$10
On filing each application for a Patent, except for a design	$15
On issuing each original Patent	$20
On appeal to Commissioner of Patents	$20
On application for Re-issue	$30
On application for Extension of Patent	$50
On granting the Extension	$50
On filing a Disclaimer	$10
On filing application for Design (three and a half years)	$10
On filing application for Design (seven years)	$15
On filing application for Design (fourteen years)	$30

The Patent Laws, enacted by Congress on the 2d of March, 1861, now in full force, and prove to be of great benefit to all parties who are concerned in new inventions.

The law abolishes discrimination in fees required of foreigners, excepting natives of such countries as discriminate against citizens of the United States—thus allowing Austrian, French, Belgian, English, Russian, Spanish and all other foreigners, except the Canadians, to enjoy all the privileges of our patent system (except in cases of designs) on the above terms. Foreigners cannot secure their inventions by filing a caveat; to citizens only is this privilege accorded.

CAVEATS.

Persons desiring to file a caveat can have the papers prepared in the shortest time by sending a sketch and description of the invention. The Government fee for a caveat is $10. A pamphlet of advice regarding applications for patents and caveats is furnished gratis, on application by mail. Address MUNN & CO., No. 37 Park Row, New York.

REJECTED APPLICATIONS.

Messrs. MUNN & CO. are prepared to undertake the investigation and prosecution of rejected cases, on reasonable terms. The close proximity of their Washington Agency to the Patent Office affords them rare opportunities for the examination and comparison of references, models, drawings, documents, &c. Their success in the prosecution of rejected cases has been very great. The principal portion of their charge is generally left dependent upon the final result.

All persons having rejected cases which they desire to have prosecuted, are invited to correspond with MUNN & CO., on the subject, giving a brief history of the case, inclosing the official letters, &c.

FOREIGN PATTENS.

Messrs. MUNN & CO., are very extensively engaged in the preparation and securing of patents in the various European countries. For the transaction of this business they have offices at Nos. 66 Chancery lane London; 29 Boulevard St. Martin, Paris; and 26 Rue des Eperonniers, Brussels. They think they can safely say that THREE-FOURTHS of all the European Patents secured to American citizens are procured through their agency.

Inventors will do well to bear in mind that the English law does not limit the issue of patents to inventors. Any one can take out a patent there.

Circulars of information concerning the proper course to be pursued in obtaining patents in foreign countries through MUNN & CO'S Agency, the requirements of different Government Patent Offices, &c., may be had, gratis, upon application at the principal office, No. 37 Park Row, New York, or any of the branch offices.

SEARCHES OF THE RECORDS.

Having access to all the official records at Washington, pertaining to the sale and transfer of patents, MESSRS. MUNN & CO., are at all times ready to make examinations as to titles, ownership, or assignments of patents. Fees moderate.

INVITATION TO INVENTORS.

Inventors who come to New York should not fail to pay a visit to the extensive offices of MUNN & CO. They will find a large collection of models (several hundred) of various inventions, which will afford them much interest. The whole establishment is one of great interest to inventors, and is undoubtedly the most spacious and best arranged in the world.

MUNN & CO. wish it to be distinctly understood that they do not speculate or traffic in patents, under any circumstances; but that they devote their whole time and energies to the interests of their clients.

COPIES OF PATENT CLAIMS.

MESSRS. MUNN & CO., having access to all the patents granted since the rebuilding of the Patent Office, after the fire of 1836, can furnish the claims of any patent granted since that date, for $1.

THE VALIDITY OF PATENTS.

Persons who are about purchasing patent property, or patentees who are about erecting extensive works for manufacturing under their patents, should have their claims examined carefully by competent attorneys, to see if they are not likely to infringe some existing patent, before making large investments. Written opinions on the validity of patents, after careful examination into the facts, can be had for a reasonable remuneration. The price for such services is always settled upon in advance after knowing the nature of the invention and being informed of the points on which an opinion is solicited. For further particulars address MUNN & CO., No. 37 Park Row, New York.

EXTENSION OF PATENTS.

Many valuable patents are annually expiring which might readily be extended, and if extended, might prove the source of wealth to their fortunate possessors. Messrs. MUNN & CO. are persuaded that very many patents are suffered to expire without any effort at extension, owing to want of proper information on the part of the patentees, their relatives or assigns, as to the law and the mode of procedure in order to obtain a renewed grant. Some of the most valuable grants now existing are *extended patents*. Patentees, or, if deceased, their heirs, may apply for the extension of patents, but should give ninety days' notice of their intention.

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Patents may be extended and preliminary advice obtained, by consulting or writing to MUNN & CO., No. 37 Park Row, New York.

ASSIGNMENTS OF PATENTS.

The assignment of patents, and agreements between patentees and manufacturers, carefully prepared and placed upon the records at the Patent Office. Address MUNN & CO., at the Scientific American Patent Agency, No. 37 Park Row, New York.

UNCLAIMED MODELS.

Parties sending models to this office on which they decide not to apply for Letters Patent and which they wish preserved, will please to order them returned as early as possible. We cannot engage to retain models more than one year after their receipt, owing to their vast accumulation, and our lack of storage room. Parties, therefore, who wish to preserve their models should order them returned within one year after sending them to us, to insure their obtaining them. In case an application has been made for a patent the model is in deposit at the Patent office, and cannot be withdrawn.

It would require many columns to detail all the ways in which the Inventor or Patentee may be served at our offices. We cordially invite all who have anything to do with patent property or inventions to call at our extensive offices, No. 37 Park Row, New York, where any questions regarding the rights of Patentees, will be cheerfully answered.

Communications and remittances by mail, and models by express (prepaid) should be addressed to MUNN & CO. No. 37 Park Row, New York.

Notes and Queries

L. M. R., of Ohio.—No chemist has ever been able to make butter; it is formed in globules in the body of the cow. The temperature of the cream is very important in churning. If it is below fifty degrees, the cream may be churned for days without separating the butter, and if much above sixty degrees, a portion of the casein will be mixed with the butter, giving it a white appearance and cheesy flavor. Milk absorbs the odor of turnips or other roots kept with it in the same cellar; it should be kept by itself in a cellar of the most immaculate cleanness, and of uniform temperature.

J. H., of Maine.—The plan of melting quartz to extract gold has been tried many times. The most plausible plan is to make the quartz into soluble glass by fusing it with an excess of soda, and it is claimed that this method is practical. A fatal objection to a gunpowder engine is the accumulation of sulphide of potassium in the cylinder. A carbonic acid engine would doubtless be sufficiently powerful to propel a flying machine a short distance.

A. A. K., of Minn.—As water under a head exerts an equal pressure in all directions, there is no objection to making a water-wheel to work by pressure. Water engines have been made essentially the same as steam engines but with larger ports. There was one employed at the water works at Washington and it was said to yield 94 per cent of the power, a larger proportion than any wheel.

H. H. S., of N. Y.—The attraction of magnetism is inverse proportion to the square of the distance, the center of power being within the magnet a short distance from the end. As your bar, B, is much nearer the magnetised wires than the bar, C, the attraction of the wires for B will be several times greater than for C, and will tend to resist a motion of the bars instead of causing them to revolve.

E. L., of N. J., and S. M., of Mass.—Pyroligneous acid is a waste product in the manufacture of gunpowder, being distilled from wood in making the charcoal. Some of the powder manufacturers purify it for market and some do not. It is also manufactured at works specially erected for the purpose in different parts of the country; there is one at Green Point, Long Island, and another near Ithaca in this State. It is used principally by dyers.

J. S. B., of N. Y.—The object of writing is to communicate the ideas of one person to another, and to accomplish this it is important that the ideas should be presented in their proper order, and one at a time. When a writer uses a parenthesis, he begins to express one idea, and interrupts the expression of that to give utterance to another. It is better generally to make a complete and separate sentence to convey the idea contained in the parenthesis.

B. T. S., of Ill.—Water is very slightly compressible, and is therefore a little more dense at the bottom of the ocean than at the surface. Hence a body that would barely sink at the surface might be arrested before it reached the bottom. This would not be the case with metals, stones, and other substances the specific gravity of which is several times greater than that of water.

A. R. C., of Ill.—We do not know of any work that has every variety of steam engine illustrated; most of the common varieties are given in "Bourne's Catechism." Steam engines are being invented every day, and it would take a large work to hold the several varieties, good, bad, indifferent, and those of no value whatever.

J. D. L., of Ky.—Of two wheels running together the smaller is the pinion. Ask your customers whether the wheels run together, and the diameter of both, then you will know which is the pinion. Some pinions on the monitor turrets are 3 feet in diameter.

E. P., of Cal.—Your communication is interesting, and is written in the clear style which is always desirable, but we are forced to reject it on account of its great length. This is one of the worst faults that an article can have for our paper.

G. J., of Minn.—You do not forfeit your patent by any delay in bringing it before the public. You are not obliged to do this.

Money Received

At the Scientific American Office, on account of Patent Office business, from Wednesday, Nov. 23, 1864, to Wednesday. Nov. 30, 1864:—

H. E. G., of N. Y., $25; C. E. R., of N. Y., $30; T. B. T., of N. Y., $25; G. & H., of Pa., $20; W. B., of Mass., $45; G. F. B., of U. S. A., $20; L. DeL., of N. Y., $30; W. F., of N. Y., $22; M. H., of N. Y., $15; M. F. R., of N. Y., $10; G. H. G., of N. Y., $10; W. F. G., of N. Y., $15; C. S., of N. Y., $15; A. L. G., of Mo., $20; E. B., of Ind., $16; P. C., of Ill., $15; A. R. D., of N. H., $15; C. B. & W. T. B., of Ill., $16; J. D., of Mich., $15; D. S., of Mass., $75; G. B., of N. Y., $35; S. R., of Pa., $25; D. M., of U. S. A., $16; C. C., of N. Y., $25; J. C., of N. Y., $15; S. & S., of Ohio, $16; B. J., of N. J., $25; J. K., of N. Y., $25; G. E. W., of N. Y., $25; J. M. M., of N. Y., $25; W. P. M., of Wis., $20; J. M., of N. Y., $15; R. & C., of Ohio, $20; J. S., of N. Y., $45; J. B., of N. Y., $40; L. W., of Conn., $20; A. M. W., of N. Y., $15; W. T. L., of N. Y., $15; J. W. P., of Ill., $20; F. I., of N. Y., $20; H. T., of N. Y., $20; W. W., of N. J., $15; J. R. S., of Ill., $10; J. R., of Ind., $16; H. W. W., of Pa., $25; J. N A., of Iowa, $25; D. C. A., of Iowa, $25; T. M. L., of N. Y., $25; A. K., of Pa., $76; L. D. H., of Ill., $25; S. W. W. & Co., of Mich., $81; F. M. G., of N. Y., $15; L. & G., of Pa., $25; E. H., of Ind., $25; H. J., of N. Y., $30; A. L. A., of N. Y., $12; J. J. G., of Ohio, $30; C. B. H., of Ill., $20; F. S., of N. Y., $15; F. H. P., of Conn., $20; A. D., of La., $20; A. H., of N. Y., $20; P. W. P., of England, $20; G. W. P., of N. Y., $22; A. W. C., of Conn., $20; W. H., of Del., $15; J. W., of N. Y., $55; S. & T., of N. Y., $15; I. A. P., of Ill., $15; H. E., of Pa., $15; I. C. P., of Ill., $30; Mrs. S., of Ill., $16; D. F. W., of Ky., $16; S. W. F., of Mass., $25; S. & L. R., of Pa., $16; W. H. L., of Texas, $25; J. E M., of Ill., $30; S. J. C., of Conn., $15; W. N. B., of Ind., $15; J. J. R., of Ill, $16; A. & G. W., of Iowa, $20.

Persons having remitted money to this office will please to examine the above list to see that their initials appear in it, and if they have not received an acknowledgment by mail, and their initials are not to be found in this list, they will please notify us immediately, stating the amount and how it was sent, whether by mail or express.

Specifications and drawings and models belonging to

parties with the following initials have been forwarded to the Patent Office, from Wednesday, Nov. 23, 1864, to Wednesday, Nov. 30, 1864:—

H. E. G., of N. Y.; G. E. W., of N. Y.; J. J. G., of Ohio; T. M. L., of N. Y.; J. N. A., of Iowa; L. D. H., of Ill.; B. J., of N. J.; G. W. P., of N. Y.; J. K., of N. Y.; A. L. A., of N. Y.; D. S., of Mass. (3 cases); P. C., of Ill.; S. R., of Pa.; D. C. S., of N. Y.; E. H., of Ind.; J. W., of N. Y.; H. J., of N. Y.; T. B. T., of N. Y.; F. & D., of Mass.; D. C. A., of Iowa; G. N. B., of Mich (2 cases); J. E. M., of Ill.; W. F., of N. Y.; C. E. R., of N. Y.; J. M. M., of N. Y.; G. B., of N. Y.; H. W. W., of Pa.; C. C., of N. Y.; J. B., of N. Y.

TO OUR READERS.

INVARIABLE RULE.—It is an established rule of this office to stop sending the paper when the time for which it was pre-paid has expired.

MODELS are required to accompany applications for Patents under the new law, the same as formerly, except on design patents, when two good drawings are all that are required to accompany the petition, specification and oath, except the Government fee.

RECEIPTS.—When money is paid at the office for subscriptions, a receipt for it will always be given; but when subscribers remit their money by mail, they may consider the arrival of the first paper a *bona-fide* acknowledgement of our reception of their funds.

PATENT CLAIMS.—Persons desiring the claim of any invention which has been patented within thirty years, can obtain a copy by addressing a note to this office, stating the name of the patentee and date of patent, when known, and enclosing $1 as fee for copying. We can also furnish a sketch of any patented machine issued since 1853, to accompany the claim, on receipt of $2. Address MUNN & CO., Patent Solicitors, No. 37 Park Row, New York.

Back Numbers and Volumes of the "Scientific American."

VOLUMES III., IV., VII., AND X., (NEW SERIES) complete (bound) may be had at this office and from periodical dealers. Price, bound, $2 25 per volume, by mail, $3—which includes postage. Every mechanic, inventor or artisan in the United States should have a complete set of this publication for reference Subscribers should not fail to preserve their numbers for binding VOLS. I., II., V., VI. and VIII. are out of print and cannot be supplied.

BINDING.—Those of our subscribers who wish to preserve their numbers of the SCIENTIFIC AMERICAN for future reference, can have them substantially bound in heavy board sides, covered with marbled paper, and leather backs and tips, for 75 cents per volume.

RATES OF ADVERTISING.

TWENTY-FIVE CENTS per line for each and every insertion, payable in advance. To enable all to understand how to calculate the amount they must send when they wish advertisements published we will explain that ten words average one line. Engravings will not be admitted into our advertising columns, and, as heretofore, the publishers reserve to themselves the right to reject any advertisement they may deem objectionable.

WANTED.—A PARTNER, EITHER ACTIVE OR silent, with a cash capital of about $20,000, to take the place of a retiring partner in a large and profitable Agricultural Implement Manufactory. Address, with real name, K. S., Box 241, Baltimore Post office. 24 5*

FOR SALE.—THE ENTIRE RIGHT FOR THE United States of my Oil Stone Fountain, illustrated in No. 24, Vol XI. of the SCIENTIFIC AMERICAN, is for sale, For further information address JAMES FUNK, Beverly, Adams county, Ill. 24 2*

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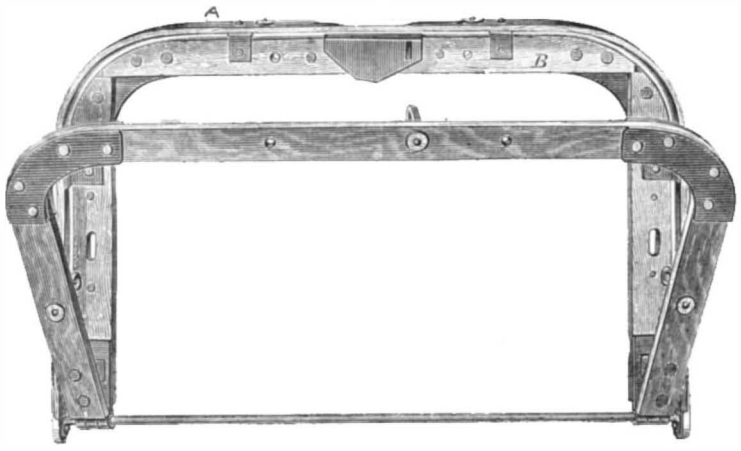

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bent piece, and this is fastened securely by the stays, B, to the side frame. In other respects this frame is not peculiar. A patent was procured on it through the Scientific American Patent Agency on the 16th of September, 1863, by Samuel Lagowitz. For further information address him at 333 Broad street, Newark, N. J.

Telegraphic Present to the Czar.

We have seen a beautiful little telegraphic present intended for the Czar of Russia, a description of which will be of interest to our readers. The article is, in fact, a complete telegraph office, comprised within the compass of a morocco case eight inches in length, six inches in width and three and one-half inches in depth. Within this case are contained a complete galvanic battery, known to telegraphers as the electropian battery, with six glass cups for the acids, in which are inserted the zinc plates and carbons by which is generated the electric fluid. Attached to each cup is a switch, by which either the whole or a part of the force of the battery can be applied to the wires connecting with the instrument. The force, or electric power, generated by this miniature battery is sufficient to work the instrument and transmit easily messages between this city and Boston. The relay magnet is only three inches in length, an inch and a half in width, comprising two coils of copper wire as fine as the finest thread, covered with fine silk, each coil covered with bone rubber and containing one mile of wire. The "sounder," by which the operator designates by the number and length of the sounds or "clicks" the letters transmitted, is only an inch and a half in length, an inch and a quarter wide, and an inch in hight, comprising two upright magnets over which is situated the armature connected with the brass standards by a small brass lever, the whole set on a hollow base of hard rubber. The key which the operator uses to transmit despatches is of brass, as is also the switch attached to it, and is mounted on hard rubber. The workmanship is of the finest character, nothing being wanted to make the whole contents of this little case a complete and thorough outfit for a first class telegraph office. The instrument is on the Morse system, and is that which is in general use in Russia. This *bijou* of telegraphy is indeed a beautiful specimen of American mechanism, such as will stimulate the Russian telegraphers to emulate, and one which will add much to the widespread fame of Charles T. Chester, Esq., its maker, as a New York artisan. Col. Charles S. Bulkley, Chief Engineer of the Russian American Telegraph line, is in possession of this miniature telegraph office, and it will be presented to his Imperial Highness, the Czar of Russia, upon the arrival of Col. Bulkley at St. Petersburg, after the completion of the great intercontinental telegraph line between the two countries.

Sweeping the Streets of New York.

Very few persons have any conception of the magnitude of the work to be performed in cleaning the streets of a large city like New York. The *Herald*, in an article on the subject, remarks:—There are two hundred and sixty-eight miles of paved streets in this city, averaging thirty-three feet in width. This gives an area of one thousand one hundred and thirty-nine acres to be cleaned. The city inspector has the whole area swept once every fortnight; about one-quarter is swept three times; three hundred and forty-five acres are cleaned six times; and seventy-five acres twelve times in the same space of time. This is equivalent to cleaning three thousand five hundred and fifty-three acres once in two weeks. In addition to this work the ash carts traverse every mile of the streets, on each side, every day, Sundays excepted. This is equivalent to traversing five hunhundred and thirty-six miles a day, and conveys some idea of the extent of this magnificent metropolis. The expense for street cleaning last year was $398,223.

KIMBALL'S WATCH MOVEMENT HOLDER.

Watch makers will appreciate this little workholder, since its use will save a good deal of time and vexation in hunting after the several parts of the watch which have been removed for cleaning or repairing. Instead of putting the parts under a bell glass on a sheet of paper, as is generally done, and turning them all over to find one particular screw, this plate is provided, and each piece is put into the hole or position it occupies in the watch. Fig. 1 is a view of the plate marked off like a "movement" and so that the workman can see at a glance what he is doing. This plate rests on a broad base which holds it firmly; the utility of it is too obvious to require further comment; it will no doubt become popular with watchmakers. A patent was issued through the Scientific American Patent Agency on Aug. 30, 1864, to E. M. Kimball, of Toledo, Ohio, whom address for further information.

Fig. 1

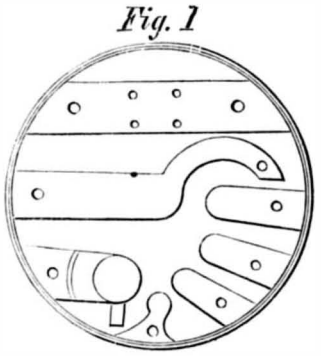
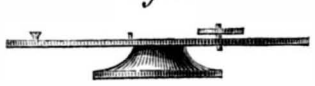


Fig. 2



New Safety Apparatus.

An ingenious apparatus for enabling persons to remain under water, or in places filled with deleterious gases, has been contrived by a French inventor. The apparatus consists simply of a piece of wood having the form and dimensions of the human mouth when open. To this piece of wood two india-rubber tubes are fixed, of any length, according to the exigencies of the case. The man engaged in the operation is further provided with a nose-pincher, or instrument for compressing the nostrils, so as to prevent the introduction of the deleterious gas or of water, as the case may be. The operator puts the piece of wood into his mouth, and puts on the nose-pincher. He stops up one of the orifices with his tongue, and inhales pure air from the other; after which he shifts his tongue on the latter orifice, and exhales his breath through the other. He continues thus regularly shifting his tongue from one orifice to the other, in the order of inspirations and expirations; but even a mistake would be of little consequence.

[This strikes us as being a complicated operation. —EDS.

THE

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